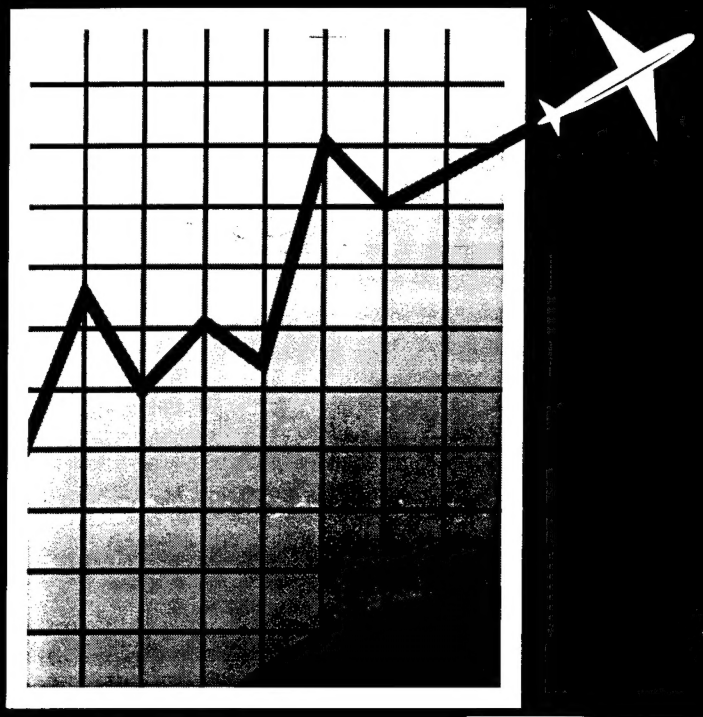
FAA AVIATION FORECASTS



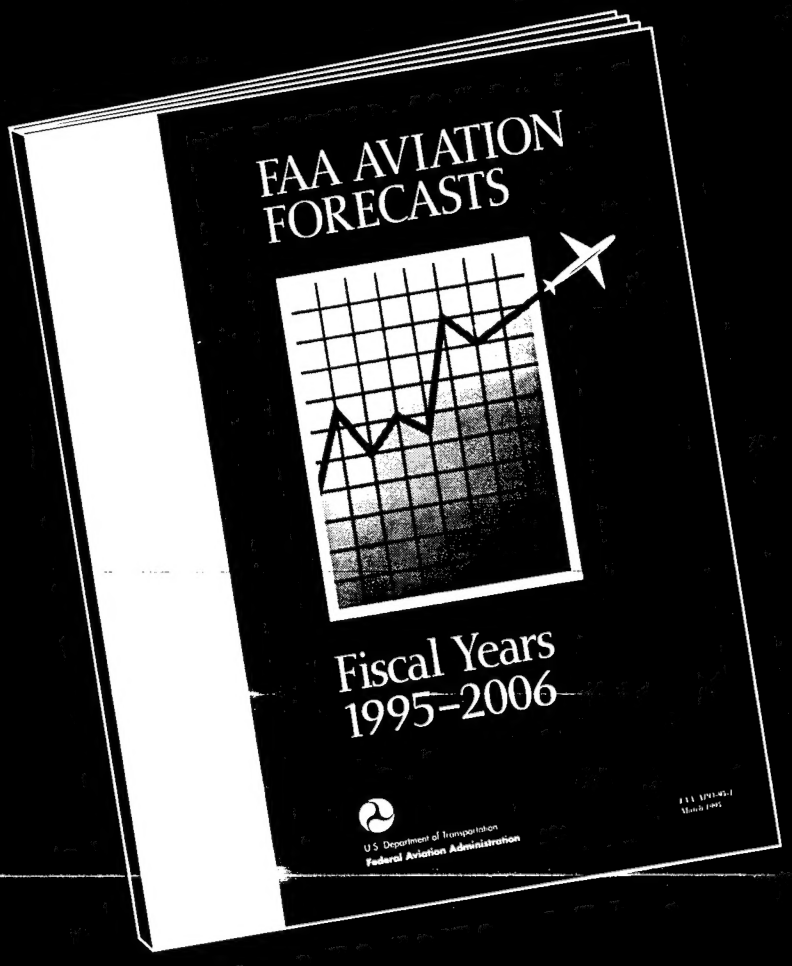
Fiscal Years 1995–2006

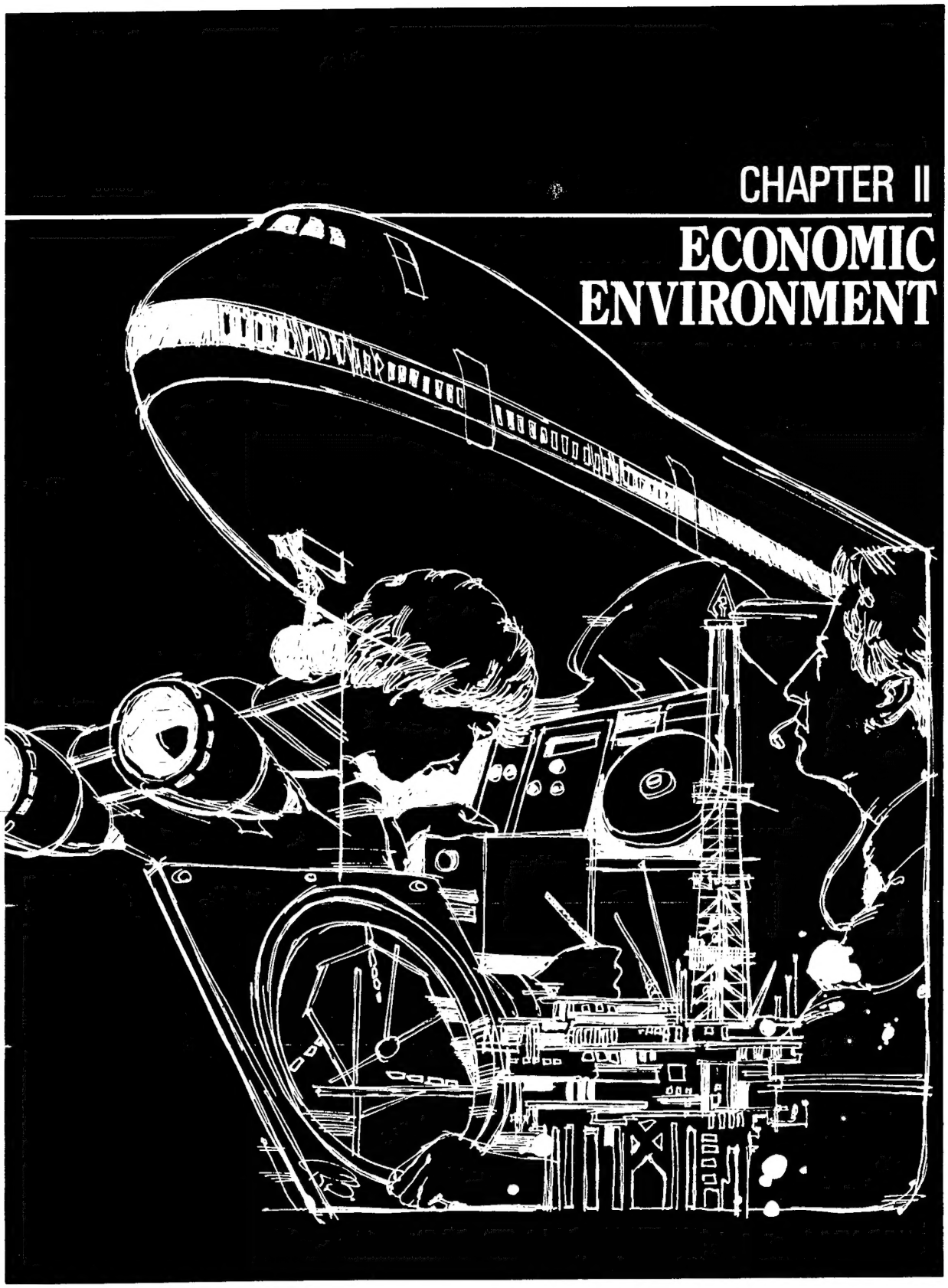
U.S. Department of Transportation
Federal Aviation Administration

FAA-APO-95-1
March 1995

CHAPTER I

EXECUTIVE SUMMARY





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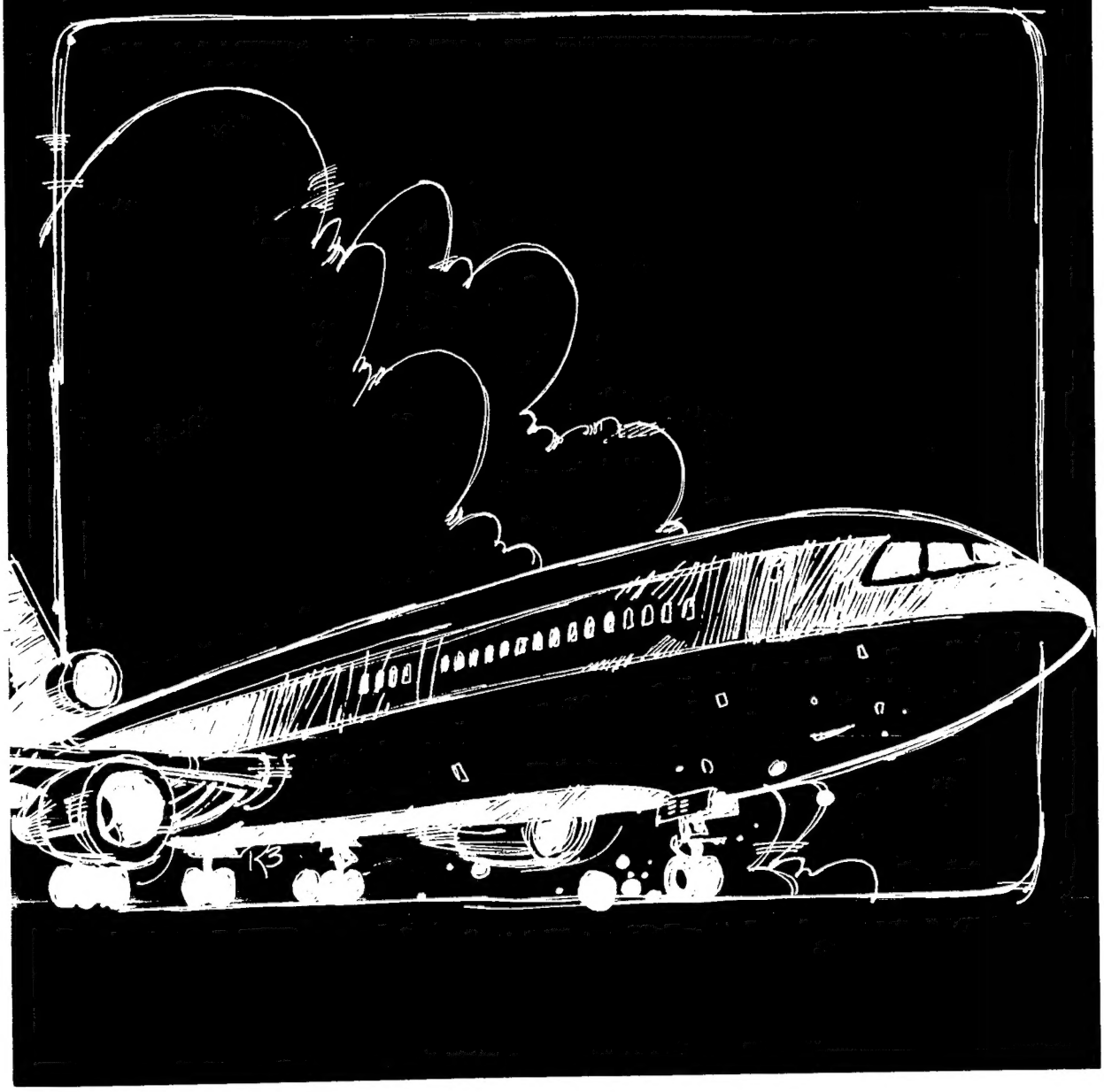

CHAPTER IV
REGIONALS/COMMUTERS

FORECAST ADDENDA

Data for the following tables arrived to late for inclusion in ***FAA Aviation Forecasts Fiscal Years 1995-2006***.

- Table 38, Active U.S. Military Aircraft in the Continental United States

- Table 39, Active U.S. Military Aircraft Hours Flown in the Continental United States

APO-110
March 3, 1995

TABLE 38

ACTIVE U.S. MILITARY AIRCRAFT

IN THE CONTINENTAL UNITED STATES [1/]

	FIXED WING AIRCRAFT				
FISCAL YEAR	JET	TURBOPROP	PISTON	HELICOPTER	TOTAL
Historical*					
1989	9,501	2,131	261	7,330	19,223
1990	10,360	2,199	258	7,200	20,017
1991	10,221	2,119	247	7,379	19,966
1992	9,672	2,035	229	7,274	19,210
1993	7,651	1,852	178	7,550	17,231
1994E	7,786	1,835	182	7,215	17,018
Forecast					
1995	7,294	1,754	229	6,930	16,207
1996	7,111	1,733	270	6,311	15,425
1997	6,988	1,688	273	5,696	14,645
1998	6,918	1,668	272	5,451	14,309
1999	6,919	1,660	270	5,350	14,199
2000	6,958	1,660	270	5,267	14,155
2001	6,998	1,661	269	5,252	14,180
2002	7,010	1,663	268	5,255	14,196
2003	7,021	1,666	268	5,261	14,216
2004	7,042	1,665	266	5,261	14,234
2005	7,055	1,665	266	5,261	14,247
2006	7.055	1,665	266	5,261	14,247

* Source: Office of the Secretary of Defense, Department of Defense.

[1/] Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

TABLE 39

ACTIVE U.S. MILITARY AIRCRAFT

HOURS FLOWN IN THE CONTINENTAL UNITED STATES [1/]

(In Thousands)

	FIXED WING AIRCRAFT				
FISCAL YEAR	JET	TURBOPROP	PISTON	HELICOPTER	TOTAL
Historical*					
1989	3,905	913	93	1,706	6,617
1990	3,849	908	88	1,733	6,578
1991	3,304	809	85	1,702	5,900
1992	3,143	785	82	1,654	5,664
1993	2,905	778	47	1,642	5,372
1994E	2,469	716	68	1,578	4,831
Forecast					
1995	2,584	749	77	1,449	4,859
1996	2,367	715	81	1,331	4,494
1997	2,282	703	79	1,310	4,374
1998	2,281	709	81	1,306	4,377
1999	2,293	707	81	1,310	4,391
2000	2,318	708	81	1,309	4,416
2001	2,337	711	80	1,310	4,438
2002	2,445	712	80	1,310	4,547
2003	2,466	713	80	1,310	4,549
2004	2,446	714	80	1,310	4,570
2005	2,471	714	80	1,310	4,575
2006	2,471	714	80	1,310	4,575

* Source: Office of the Secretary of Defense, Department of Defense.

[1/] Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

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16. Abstract

This report contains the Fiscal Years 1995-2006 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with FAA control towers, air route traffic control centers, and flight service stations. Detailed forecasts were made for the major users of the National Aviation System: air carriers, air taxi/commuters, military, and general aviation. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public.

The outlook for the 12-year forecast period is for moderate economic growth, stable real fuel prices, modest inflation, and continued moderate to strong growth in the demand for aviation services. Based on these assumptions, aviation activity is forecast to increase by 19.7 percent at FAA towered airports (352 airports) and 26.0 percent at air route traffic control centers. The general aviation active fleet is forecast to decline by 0.8 percent during the forecast period but increased utilization (hours flown by aircraft) results in a 12.0 percent increase in general aviation hours flown during same period. Scheduled domestic revenue passenger miles (RPMs) are forecast to increase 60.5 percent, scheduled international RPMs are forecast to increase by 97.2 percent, and regional/commuter RPMs are forecast to increase by 154.1 percent.

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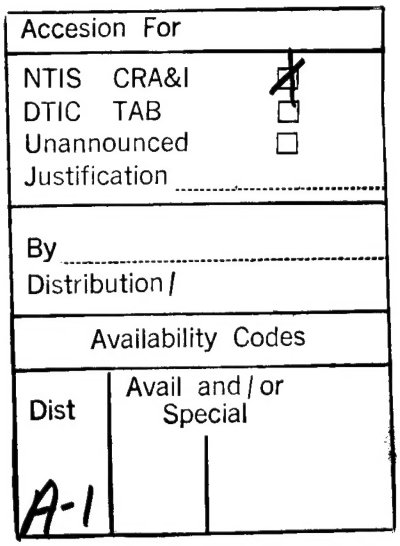


I am pleased to submit to the aviation community FAA Aviation Forecasts, Fiscal Years 1995-2006. These forecasts are developed annually by Robert L. Bowles and his staff in the Statistics and Forecast Branch for use by the agency in its planning and decision-making processes. In addition, the forecasts are used extensively within the aviation and transportation communities as the industry looks to and prepares for the future.

This year's report consists of nine chapters, discussing in detail three major areas: (1) the economic environment, assumptions, and predictions that are used to develop the forecasts; (2) historical data and forecasts of future traffic demand and aircraft activity for each of the major nonmilitary user groups--commercial air carriers, regional/commuter airlines, general aviation, and helicopters; and (3) workload measures for FAA towers, centers, and flight service stations. The report concludes with a discussion of our forecast accuracy and year-by-year data for our individual forecasts of aviation activity.

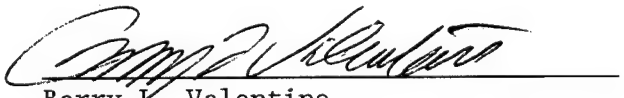
Briefly, the forecast predicts a continued expansion of both the U.S. economy and U.S. commercial aviation activity. International markets are anticipated to grow more rapidly than are domestic markets, especially along the Pacific Rim and in Latin America. However, the uncertain short-term economic outlook in both Japan and Eastern Europe could restrict growth in these areas during the early years of the forecast period.

Based on economic projections provided by the Office of Management and Budget and by DRI/McGraw-Hill, Evans Economics, and The WEFA Group, we expect the U.S. economy (as measured by real gross domestic product) to grow at an average annual rate of 2.5 percent between 1995 and 2006, with higher increases projected for many major foreign countries and regions. Combining information on economic projections (e.g., GDP growth and oil prices) and industry assumptions (e.g., industry capacity and yield management) with analyst expertise results in an anticipated

average annual growth rate (as measured in revenue passenger miles) of 4.5 percent from 1995 to 2006. Annual domestic growth is expected to average 4.0 percent and annual international growth is projected to be 5.8 percent.

In reading and using the information in this book, it is important to recognize the limits of forecasting. That is, forecasting is not an exact science. Its accuracy depends heavily on underlying economic and political assumptions. While there is basic agreement between the Administration's short-term economic projections and those of the various econometric forecasting services, the economic outlook may change. Such shifts could alter the demand for aviation services.

If in using this document you see opportunities for improvement, I would appreciate hearing from you. You are encouraged to send your comments to me at the Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591.



Barry L. Valentine
Assistant Administrator for Policy, Planning, and International Aviation

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CHAPTER I

EXECUTIVE SUMMARY

CHAPTER I

EXECUTIVE SUMMARY

STRONG GROWTH, AT LAST!

The commercial aviation industry breathed a collective sigh of relief in fiscal year 1994 (all stated years are fiscal years unless specifically noted otherwise), as most sectors of the industry recorded their first robust growth of the 1990s. Domestically, this growth was spurred, in part, by strong U.S. economic growth and, by the restructuring now taking place within the U.S commercial airline industry.

Prior to 1994, U.S. economic growth had averaged only 1.9 percent annually during the 1990s. This included a three quarter recession in 1990/1991, which slowed economic growth to only 0.8 percent over the 2-year period. The recession was followed by a very weak recovery (1.7 percent growth in 1992), whose slow pace was generally recognized as unprecedented in postwar U.S. history. However, the U.S. economy has now grown for 14 consecutive quarters, with real growth averaging 3.2 percent in 1993 and 3.7 percent in 1994.

Globally, economic growth has averaged less than half that of the United States. Worldwide real GDP increased at an annual rate of only 0.9 percent during the 1990s, including an absolute decline of 0.4 percent in calendar year (CY) 1991. Growth in 1993 averaged 1.2 percent while growth in CY 1994 measured 2.2 percent.

With the exception of Eastern Europe, Venezuela, and Turkey, whose economies are still experiencing structural problems, global economic activity was relatively strong in CY 1994. Economic growth in the Pacific Basin averaged 7.1 percent while the economies in Latin American countries averaged 3.0 percent. Canada is in the midst of a robust expansion phase (GDP up 3.8 percent) while economic recovery appears to be finally taking shape in Western Europe (GDP up 2.3 percent). Japan, recovering from its longest recession in the post-war period, still lags all other OECD countries in terms of economic growth (GDP up 1.0 percent in CY 1994).

This stronger economic activity had a major impact on the demand for aviation services. U.S. commercial air carrier passenger enplanements, which had averaged only 1.5 percent annual growth during the preceding 4 years, were up 8.2 percent in 1994, the largest growth since 1987. Air carrier revenue passenger miles were up 5.5 percent in 1994, the strongest growth since 1986.

Worldwide traffic demand also exper-

ienced relatively strong growth during CY 1994. The Association of European Airlines reported that its members' traffic grew 8.6 percent (9 months 1994) while 11 Asian and Middle Eastern airlines reported growth of 10.1 percent (6 months 1994). Somewhat slower growth was reported by the two Canadian flag airlines (5.0 percent, 8 months 1994) and three Latin American airlines (3.0 percent, 7 months 1994).

The financial performance of commercial airlines also showed considerable improvement in 1994. During the previous 4 years, U.S. commercial airlines' cumulative operating losses totaled almost $5.0 billion. In 1994, the industry reported operating profits totaling nearly $2.6 billion. The industry reported net profits of almost $1.2 billion in 1994.

Based on data compiled by the International Civil Aviation Organization (ICAO), world airlines (including U.S. carriers) reported cumulative operating profits totaling only $1 billion during the 4-year period between CY 1990 and CY 1993. Data is not available for CY 1994; however, preliminary financial results reported in various trade publications indicate that world airlines are also reporting improved financial results.

Although the U.S. commercial airline industry reported significant improvements in both traffic and profits in 1994, there continues to be considerable disparity among the individual carriers. At the one extreme is Southwest Airlines. During the 1990s, Southwest's traffic has increased by over 90 percent and its cumulative profits have totaled $874 million.

At the other extreme are a number of carriers, both large and small. In 1994, the 11 majors reported operating profits of $2.3 billion. However, four of the majors reported losses ranging from $1.2 to $413.3 million. And, once again, financial analysts are beginning to make dire predictions concerning the imminent bankruptcy and/or liquidation of one or more of the majors.

While the smaller nationals and regionals were able to outperform the larger majors in terms of traffic generation in 1994 (enplanements up 40 percent compared to only 5.2 percent for the majors), smaller size was not, in itself, a guarantee of profitability. The combined operating profit of these 42 smaller carriers totaled only $271.7 million in 1994, with 14 carriers reporting losses ranging from $85,000 to $73.5 million. Even the widely acclaimed Southwest clones (Kiwi International, Reno Air, and Valujet) were not immune to red ink, reporting combined operating losses of $35.1 million in 1994.

Extensive restructuring continues to be a priority among the larger carriers. This restructuring includes, among other things, the deferment of new aircraft deliveries, route realignments (both domestic and international), reducing service at or withdrawing from unprofitable hubs, transferring short-haul routes to regional code-sharing partners, and cutting jobs and/or salaries. For most, however, the bottom-line or goal is to reduce the cost per seat-mile to 7.5 cents--the level now achieved by Southwest Airlines. For comparison purposes, this represents a 30 percent reduction from the current industry average of 10.77 cents.

The regional/commuter airline industry continues to be the fastest growing sector of the aviation community, with passenger traffic increasing by 67.0 percent during the 1990s--up 14.3 percent in 1994. A large part of this growth results from the restructuring and/or route rationalization/realignment taking place among the larger air carriers. Additionally, a number of the regional/commuter carriers are now operating small jet aircraft (e.g., the Canadair Regional Jet [50 seats] and Avro RJ-70 [75 seats]). The operation of jet aircraft is

expected to further blur the distinction between the smaller regional carriers and the larger air carriers and should lead to greater acceptance of the smaller regional/commuter carriers by the traveling public.

Most activity measures for general aviation continued to decline during the 1990s. Between CY 1990 and CY 1994, the number of active general aviation aircraft and hours flown declined 10.0 and 22.0 percent, respectively. The number of student pilots was down 16.3 percent, while the number of private pilots declined 3.9 percent. Shipments of general aviation aircraft were down 35.7 percent, although shipments increased slightly in FY 1994. Billings, however, were up 26.0 percent during this same 5-year period, due to the large increase in the unit value of the aircraft being shipped.

One of the major challenges which confronts the general aviation industry is the rapidly increasing prices of general aviation aircraft. On August 17, President Clinton signed the General Aviation Revitalization Act, establishing an 18-year Statute of Repose on all general aviation aircraft and components. This Act, which limits the liability of manufacturers to 18 years from the date of manufacture, may halt the upward spiral in the prices of general aviation aircraft. This could be the first step in revitalizing the market for general aviation aircraft and services.

The FAA is well aware that one year of strong growth does not necessarily indicate a continuing trend. Nevertheless, there are a number of encouraging signs that presage a continuation of current rebound in traffic for at least the next several years.

The U.S. economy grew by 3.7 percent in 1994. The Conference Board's index of consumer confidence (1985 equals 100) reached 101.3 in November, a 12 point increase over October 1994 (89.1) and the highest level achieved since July 1990. Personal income grew by 1.4 percent in October, the strongest one month's growth this year. The Bureau of Labor Statistics reported a 350,000 gain in payroll jobs and a decline in the unemployment rate to 5.6 percent in November.

In the manufacturing sector, most economic indicators also remain quite robust. Industrial production was up 0.7 percent in October. Manufacturing employment rose by 51,000 in November, bringing the year-over-year gain to almost 250,000 new jobs.

The recent passage of General Agreement on Tariffs and Trade (GATT) is expected to benefit both the U.S. and world economies. GATT is expected to increase U.S. exports of goods and services by as much as 2.5 percent annually, increasing real GDP growth as much as 0.3 percent annually over the next 10 years. The new GATT accord is also expected to reduce prices by reducing the taxes on imported goods. In addition, GATT is expected to promote a higher rate of world economic growth through increased trading opportunities. Increased trading opportunities will, almost certainly, lead to increased demand for aviation services.

Despite the many positive statistics and/or trends, there are a number of uncertainties that could limit the growth of the U.S. economy and ultimately, the demand for aviation services. Corporate America continues to downsize and/or automate its operations, eliminating many middle management positions and reducing the base of both current and future business travelers. Technological improvements in communications, including advances in teleconferencing and facsimile mail, also have the potential to have a large impact on future business travel.

The Federal Reserve Board appears to be continuing its move toward a more restrictive monetary policy, with likely further increases in interest

rates. These increases, in combination with the recent rapid rises in consumer installment credit, could slow consumer spending, including travel expenditures, in 1995 and beyond.

REVIEW OF 1994

In 1994, the large U.S. air carriers increased their system capacity (available seat miles) by only 0.9 percent, while demand (revenue passenger miles) increased by 5.5 percent. As a result, the system-wide load factor (both domestic and international service) increased from 62.9 percent in 1993 to 65.8 percent in 1994--an all-time high. The previous highest load factor was 63.7 percent recorded in 1992.

In 1994, domestic capacity and traffic were up 1.6 and 6.5 percent, respectively. However, much of this increase was the result of considerably stronger growth among the smaller nationals and regionals. In 1994, the 10 majors' traffic grew by 4.0 percent while the national/regionals' traffic increased 50.7 percent. During this same period, the majors' capacity increased by only 1.0 percent compared to a 25.0 percent increase by the nationals/regionals. As a result of the significantly slower grow in capacity during 1994, domestic carriers established an all-time high load factor of 64.3 percent, eclipsing the previous high of 62.6 percent set in 1992.

International traffic grew by only 2.8 percent in 1994, primarily the result of the continued slow recovery in the Japanese economy. Transpacific traffic, which had increased at an average annual rate of 17.5 percent between 1986 and 1992, declined 0.2 percent in 1994, the second consecutive year of decline. Latin American traffic grew by 6.0 percent while North Atlantic traffic was up 4.2 percent.

Strong traffic growth in 1994, combined with the industry's restructuring/cost cutting programs, resulted in substantial improvements to the industry's balance sheet--a $2.6 billion profit compared to only $324 million in 1993. However, significantly higher profits are required if the industry is to be able to finance the replacement and new aircraft needed to accommodate future growth.

New commercial aircraft orders totaled only 318 (down 18.5 percent) in 1994, while new aircraft deliveries totaled 518 (down 22.2 percent). The decline in both orders and deliveries reflects, in part, the current restructuring taking place among large U.S. commercial air carriers. Although the demand for narrowbody aircraft continues to outpace the demand for widebody aircraft--64.2 percent of total orders and 66.4 percent of total deliveries--this segment of the aircraft market is also being heavily impacted by the restructuring. Only 344 narrowbody aircraft were delivered in 1994, 25.5 percent fewer than delivered in 1993 and 44.0 percent fewer than delivered in 1992. Although the impact on future orders for narrowbody aircraft has been less severe--down 12.8 percent in 1994 and 20.0 percent over the past two years--the 204 narrowbody aircraft orders in 1994 represent the lowest total since 1983.

The regional/commuter airline industry continued its rapid expansion in 1994. Regional/commuter airline passenger enplanements totaled 53.6 million, an increase of 14.8 percent. Regional/commuter airlines recorded 11.1 billion revenue passenger miles in 1994, an increase of 18.1 percent.

In 1994, there were 876 general aviation aircraft shipments, 4.9 percent more than in 1993. The shipments consisted of 444 piston aircraft (down 5.9 percent) and 422 turbine-powered

aircraft (up 11.4 percent). Because of the greater average dollar value of the aircraft being shipped, billings increased 14.4 percent over 1993 to just under $2.3 billion.

The active general aviation fleet is estimated to have totaled 176,006 on January 1, 1994, a decline of 4.1 percent from the previous year's estimate. These active aircraft flew an estimated 24.1 million hours in CY 1994, a decline of 1.2 percent from CY 1993.

Operations at FAA air traffic control towers increased only 0.3 percent in 1994. This relatively small growth was due, in large part, to declines in both general aviation (down 1.5 percent) and military (down 7.0 percent) activity. Commercial activity increased 4.1 percent in 1994.

Instrument operations at FAA towered airports increased somewhat faster in 1994, up 2.2 percent from 1993 activity levels. The number of IFR aircraft handled at the air route traffic control centers increased 3.7 percent in 1994, largely on the strength of a 5.3 percent increase in the commercial sector. The number of general aviation aircraft handled at the en route centers was up 3.3 percent in 1994, while the number of military aircraft handled declined 4.2 percent.

In summary, the impact of strong U.S. economic growth, in combination with the success enjoyed by the recently certificated and spin-off low-cost carriers in short-haul markets, resulted in relatively strong demand for commercial air services during 1994. Industry restructuring, in combination with the implementation of numerous cost-cutting measures, resulted in significant improvements in the financial viability of the U.S. commercial aviation industry.

The results for the general aviation sector were generally mixed in 1994. Active aircraft and hours flown continued to decline but aircraft shipments and billings were up slightly. More importantly, however, is the fact that both instrument operations at FAA towered airports and the number of IFR aircraft handled at en route centers increased in 1994. This suggests a potential resurgence in business/corporate flying. However, perhaps the most single important event for general aviation occurred on August 12 when President Clinton signed the General Aviation Revitalization Act. This Act may give the needed boost to help revitalize the market for general aviation products and services.

ECONOMIC FORECASTS

Gauging the timing, strength, and duration of the U.S. and world economic recovery continues to be a source of consternation for many economists and economic forecasting services. This uncertainty makes it extremely difficult to predict the demand for aviation services with any degree of confidence.

There is, however, some basic agreement as to both the short- and long-term economic outlook for the U.S. economy. This agreement applies to both the three economic forecasting services used by the FAA (DRI/McGraw-Hill, Evans Econometrics, and The WEFA Group) and also the Office of Management and Budget's (OMB) economic assumptions.

These economic forecasts were used to develop the FAA aviation forecasts and anticipate strong growth in 1995 (up 3.1 percent), then weakening somewhat in 1996 (up 2.4 percent). For the 10 remaining years of the forecast period (through 2006), the consensus is that the U.S. economy will experience moderate economic growth of approximately 2.5 percent annually.

Worldwide economic growth is expected to exceed that of the United States,

FAA FORECAST ECONOMIC ASSUMPTIONS

FISCAL YEARS 1995 - 2006

ECONOMIC VARIABLE	HISTORICAL 1985	HISTORICAL 1993	HISTORICAL 1994	FORECAST 1995	FORECAST 1996	FORECAST 2006	PERCENT AVERAGE ANNUAL GROWTH 85-94	93-94	94-95	95-96	94-06
UNITED STATES											
Gross Domestic Product (Billions 1987$)	4,247.0	5,095.2	5,289.6	5,455.8	5,587.8	7,143.8	2.5	3.8	3.1	2.4	2.5
Consumer Price Index (1982-84 = 100)	106.7	141.2	144.7	149.0	153.8	218.2	3.4	2.5	3.0	3.2	3.5
Oil & Gas Deflator (1987 = 100)	122.2	124.7	121.5	119.2	122.8	178.9	(0.1)	(2.5)	(1.9)	3.0	3.3
INTERNATIONAL											
Gross Domestic Product (Bil U.S. 1985$)											
Atlantic *	4,090.4	4,967.6	5,093.1	5,275.3	5,460.6	7,393.9	2.5	2.5	3.6	3.5	3.2
Latin America	858.0	1,037.8	1,068.7	1,113.2	1,170.5	1,865.6	2.5	3.0	4.2	5.2	4.7
Pacific **	1,919.8	2,703.5	2,780.9	2,884.5	3,008.1	4,589.7	4.2	2.9	3.7	4.3	4.3
Exchange Rates (US$/Local Currency)											
United Kingdom	1.444	1.481	1.524	1.411	1.446	1.203	0.6	2.9	(7.4)	2.5	(2.0)
Germany	0.406	0.579	0.610	0.556	0.571	0.550	4.6	5.4	(8.9)	2.7	(0.9)
Japan	4.988	8.941	9.524	8.511	8.696	10.798	7.5	6.5	(10.6)	2.2	1.1

Source: United States: FY 1995-2000; Executive Office of the President, Office of Management and Budget
FY 2001-2006; Consensus growth rate of DRI/McGraw-Hill, Evans Economics, Inc., and The WEFA Group
International: CY 1985-2006: The WEFA Group

* Sum of GDP for Europe, Africa, and Middle East
** Sum of GDP for Japan, Pacific Basin, Australia, and New Zealand.

averaging 3.9 percent over the 12-year forecast period. Economic growth is forecast to be greatest in Latin America (4.7 percent) and the Far East/ Pacific Basin countries (4.3 percent annually). Economic growth in Europe/ Africa/Middle East countries averages 3.2 percent during the 12-year forecast period.

While economic recovery is progressing as expected in North America, Latin America, the Pacific Basin, and Western Europe, the expected recovery in Japan has not yet materialized. It is the uncertain short-term economic outlook, particularly in Japan and Eastern Europe, that presents both U.S. and world aviation with the greatest challenges to future growth. However, the Japanese economy is projected to grow by 2.5 percent in CY 1995, 3.1 percent in CY 1996, and 4.4 percent in CY 1997. Unfortunately, political uncertainty and structural problems continue to cloud the economic outlook for the former Soviet Union and Eastern Europe.

Inflation (as measured by the consumer price index) is projected to remain in the low to moderate range, averaging 3.1 percent between 1995 and 2000 and 3.9 percent between 1001 and 2006--3.5 percent over the entire 12-year forecast period.

Oil prices are expected to decline slightly (1.9 percent) in 1995 then increase at an average annual rate of 3.8 percent over the remaining 11 years of the forecast period. This forecast assumes no major disruptions in the price or availability of oil.

The projected growth of aviation demand discussed in subsequent chapters of this document is consistent with these national short- and long-term economic growth forecasts. The table on the preceding page summarizes the key economic assumptions used in developing the aviation demand forecasts. The economic forecasts are presented in tabular form in Chapter IX, Tables 1 through 5.

It should be stressed, however, that in any given year there is likely to be some perturbation around the long-term trend. None of the current economic models is sufficiently precise to predict interim business cycles. In addition, unanticipated developments, such as the 1990 Iraqi invasion of Kuwait and subsequent Gulf War, cannot be predicted at all.

AVIATION ACTIVITY FORECASTS

Domestic air carrier revenue passenger miles are forecast to increase at an annual rate of 4.0 percent between 1995 and 2006. The forecast assumes relatively stronger growth during the first 3 years of the forecast period (averaging 5.3 percent). This is based on the assumed continuation of the trend toward increased competition and stronger traffic growth in short-haul markets. Domestic enplanements are forecast to increase by 6.1 percent in 1995, 5.9 percent in 1996, 5.4 percent in 1997, and average 4.0 percent over the 12-year forecast.

The forecasts assume that real passenger yields will continue to decline throughout the 12-year forecast period (1.9 percent annually) as a combination of competitive forces and current restructuring/cost-cutting efforts continue to exert downward pressure on fare levels. The decline is expected to be greater during the first three years of the forecast period (2.9 percent annually), due largely to the increased competition in short-haul markets.

Air carrier aircraft operations are forecast to increase at an annual rate of 1.9 percent during the 12-year forecast period. Again, stronger growth is forecast for the first 3 years of the

forecast period (averaging 3.0 percent). This is largely due to the expected stronger growth in short-haul markets relative to long-haul markets during this period. For the period 1995 to 1997, this stronger growth in short-haul markets also results in higher load factors, declining seating capacity for air carrier aircraft, and declining passenger trip lengths.

International air carrier revenue passenger miles and passenger enplanements are both forecast to increase at annual rates of 5.8 percent over the 12-year forecast period. International travel is, to a large extent, being driven by the strong demand projected in Latin American (6.3 percent annually in RPMs) and Transpacific (6.2 percent) markets. North Atlantic markets are expected to grow by 5.3 percent over the forecast period. Short-term growth is constrained somewhat by economic conditions in Eastern Europe and Japan.

The air carrier forecasts assume that the industry will benefit from the strong economic growth taking place both within the United States and worldwide. In addition, it is assumed that the industry will continue its current restructuring and cost-cutting efforts, thus improving the industry's overall financial performance. The retirement of large numbers of stage-2 aircraft and their replacement by more fuel efficient stage-3 aircraft is expected to increase industry productivity. This will also improve the industry's financial performance. The forecast further assumes that U.S. air carriers will convert to an all stage-3 fleet (including retrofitted stage-2 aircraft) by the year 2000. Present aircraft orders, options, and retrofit prospects support this assumption.

In 1994, the regional/commuter airlines enplaned 53.6 million passengers, 10.5 percent of all passenger traffic in scheduled domestic air service. By the year 2006, these carriers are expected to carry 115.1 million passengers (6.6 percent growth annually) and to account for 13.7 percent of all domestic passenger enplanements.

Regional/commuter airlines are also expected to continue the trend toward purchase of small jet aircraft and larger, propeller-driven aircraft, thus significantly increasing the average seating capacity of the regional fleet, from an average 23.7 seats in 1994 to 34.9 seats in 2006.

The forecast also assumes increased business use of general aviation. This is reflected in the changing character of the general aviation fleet. The more expensive and sophisticated turbine-powered part of the fixed wing fleet is expected to grow much faster than the piston aircraft portion. In CY 1994, there were an estimated 8,218 turbine-powered aircraft in the fixed wing general aviation fleet--4.7 percent of the total fixed wing fleet. By CY 2006, it is projected that there will be 11,100 turbine-powered aircraft--6.4 percent of the total fixed wing fleet. Similarly, there were 2,864 turbine-powered aircraft in the helicopter fleet in CY 1994--63.5 percent of the total rotorcraft fleet. By CY 2006, it is projected that there will be 4,100 turbine-powered aircraft--73.2 percent of the total helicopter fleet.

The general aviation piston fleet is projected to decline in absolute numbers over the 12-year forecast period. The number of single engine piston aircraft is projected to decline from 130,687 in CY 1994 to 122,400 in CY 2006. Multi-engine piston aircraft are projected to decline from 16,406 to 16,000 over the same time period.

The FAA aviation traffic and activity forecasts are summarized in the table on page I-9.

AVIATION ACTIVITY FORECASTS

FISCAL YEARS 1995 - 2006

AVIATION ACTIVITY	HISTORICAL 1985	1993	1994	FORECAST 1995	1996	2006	PERCENT AVERAGE ANNUAL GROWTH 85-94	93-94	94-95	95-96	94-06
AIR CARRIER											
Enplanements (Millions)											
Domestic	350.4	434.0	472.0	501.0	530.3	754.3	3.4	8.7	6.1	5.9	4.0
International	24.3	45.2	46.3	48.6	51.6	90.6	7.4	2.4	5.0	6.2	5.8
Atlantic	11.4	15.7	16.5	17.4	18.5	30.4	4.2	4.9	5.4	6.3	5.2
Latin America	7.9	15.8	16.4	17.3	18.4	33.2	8.5	3.7	5.3	6.4	6.0
Pacific	5.0	13.6	13.4	13.9	14.7	27.0	11.6	(1.9)	4.0	5.8	6.0
System	374.6	479.2	518.3	549.6	581.9	844.9	3.7	8.2	6.0	5.9	4.2
RPMs (Billions)											
Domestic	265.8	348.6	371.4	391.5	412.2	596.2	3.8	6.5	5.4	5.3	4.0
International	64.4	134.8	138.5	145.5	154.7	273.1	8.9	2.8	5.0	6.3	5.8
Atlantic	36.1	61.5	64.1	67.6	72.0	119.6	6.6	4.2	5.5	6.5	5.3
Latin America	9.7	20.8	22.1	23.4	24.9	46.1	9.6	6.0	6.2	6.4	6.3
Pacific	18.6	52.4	52.4	54.4	57.7	107.4	12.2	(0.2)	4.0	6.0	6.2
System	330.2	483.4	509.9	537.0	566.9	869.3	4.9	5.5	5.3	5.6	4.5
REGIONALS/COMMUTERS											
Enplanements (Millions)	24.4	46.7	53.6	58.4	62.6	115.1	9.1	14.8	9.0	7.2	6.6
RPMs (Billions)	3.6	9.4	11.1	12.4	13.6	28.2	13.3	18.1	11.7	9.7	8.1
FLEET											
Air Carrier	2,938	4,263	4,426	4,474	4,582	6,531	4.7	3.8	1.1	2.4	3.3
Regionals/Commuters	1,551	2,054	2,179	2,284	2,396	3,250	3.9	6.1	4.8	4.9	3.4
General Aviation (000)	219.6	183.6	176.0	173.8	171.7	174.6	(2.5)	(4.1)	(1.3)	(1.2)	(0.6)
HOURS FLOWN (Millions)											
Air Carrier	7.7	11.0	11.2	11.4	11.7	17.8	4.3	1.4	1.5	2.5	3.9
Regionals/Commuters	N.A.	2.9	3.0	3.1	3.2	4.5	N.A.	1.7	4.0	3.8	3.5
General Aviation	30.9	24.4	24.1	24.3	24.5	27.0	(2.8)	(1.2)	0.8	0.8	1.0

Source: 1985-94 DOT-RSPA, FAA data
1995-2006; FAA forecasts

FAA WORKLOAD FORECASTS

The FAA forecasting process is a continuous one that requires the FAA's Statistics and Forecast Branch to interact with various FAA offices and services, other Government agencies, and aviation industry groups, including discussions with many commercial airlines and aircraft/engine manufacturers. In addition, the process uses a number of different economic and aviation data bases, the outputs of several econometric models and equations, and several other analytical techniques. The FAA workload measures, which are summarized in the table on page I-11, are the resultant forecasts of this process. These forecasts are used by the agency for manpower staffing and facility planning.

After declining for three consecutive years (1991-1993), the demand for FAA operational services at towered airports increased slightly in 1994. This increase was, in large part, due to exceptionally strong growth in commercial aircraft activity (the sum of air carrier and commuter/air taxis). This upward trend in commercial activity is expected to continue throughout the 12-year forecast period. However, total activity at FAA towered airports is expected to continue to increase at a somewhat slower pace due to declining military activity and slower growth by the general aviation sector.

In 1994, operations at the 402 FAA towered airports totaled 60.3 million. In 2006, activity at FAA towered airports is projected to total 68.0 million, an average annual increase of only 1.0 percent over the 1994 activity level. However, future growth at FAA towered airports is impacted by the agency's tower conversion plan. During 1995, 50 Level 1 VFR towered airports (3.5 million operations in 1994) are scheduled to be converted to contract towers. Therefore, activity at these airports are not included in the forecasts of future FAA tower activity. If these 50 airports are excluded from the 1994 tower counts (a new base of 56.8 million operations), activity at the remaining 352 FAA towered airports is expected to increase at an average annual growth rate of 1.5 percent over the 12-year forecast period.

The increased use of avionics by regional/commuter airlines and general aviation aircraft, combined with the implementation of additional airport radar service areas, is expected to result in instrument operations at FAA towered airports increasing at a somewhat faster rate than total aircraft operations. Instrument operations are forecast to increase from 46.7 million in 1994 to 57.0 million in fiscal year 2006, a 1.7 percent annual growth rate.

The workload at the air route traffic control centers is forecast to increase at an average annual rate of 1.9 percent during the 12-year forecast period. In 2006, FAA en route centers are expected to handle 48.9 million IFR aircraft, up from 38.8 million in 1994.

The higher growth rate at en route centers, relative to activity at towered airports, results from the fact that commercial activity accounts for a significantly larger percentage of center activity (68.3 versus 38.5 percent at towered airports). Therefore, the projected increases in commercial aircraft activity, especially during the first 3 years of the forecast period, will have a much greater impact on total center traffic.

For each of the three workload measures, commercial aircraft activity is forecast to increase at a significantly faster rate than is noncommercial aircraft activity (the sum of general aviation and military). Forecast growth rates for commercial and noncommercial activity during the 12-year

FAA WORKLOAD MEASURES

FISCAL YEARS 1995 - 2006

WORKLOAD MEASURES (IN MILLIONS)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1985	1993	1994	1995	1996	2006	85-94	93-94	94-95	95-96	94-06
Aircraft Operations											
Air Carrier	11.3	12.6	13.2	13.6	14.0	16.6	1.7	4.8	3.0	2.9	1.9
Commuter/Air Taxi	6.9	9.7	10.0 (9.5)	9.9	10.1	13.1	4.2	3.1	4.2	2.0	2.7
General Aviation	37.2	35.2	34.7(31.8)	33.9	32.4	36.4	(0.8)	(1.4)	6.6	(4.4)	1.1
Military	2.5	2.6	2.4 (2.3)	2.2	1.9	1.9	(0.5)	(7.7)	(4.4)	(13.6)	(1.6)
TOTAL	57.9	60.1	60.3(56.8)	58.6	58.4	68.0	0.5	0.3	3.2	(0.3)	1.5
Instrument Operations											
Air Carrier	11.8	13.6	14.3	14.7	15.1	18.1	2.1	4.4	2.8	2.7	2.0
Commuter/Air Taxi	6.4	10.4	10.8	11.1	11.4	14.4	6.0	3.9	2.8	2.7	2.4
General Aviation	16.4	17.7	18.0	18.3	18.6	21.0	1.0	1.7	1.7	1.6	1.3
Military	4.1	3.9	3.7	3.6	3.5	3.5	(1.1)	(5.1)	(2.7)	(2.8)	(0.5)
TOTAL	38.7	45.7	46.7	47.7	48.6	57.0	2.1	2.1	2.1	1.9	1.7
IFR Aircraft Handled											
Air Carrier	14.6	19.0	20.0	20.6	21.2	26.3	3.6	5.3	3.0	2.9	2.3
Commuter/Air Taxi	4.8	6.2	6.5	6.8	7.0	9.1	3.4	4.8	4.6	2.9	2.8
General Aviation	8.3	7.4	7.7	7.9	8.1	9.1	(0.8)	4.1	2.6	2.5	1.4
Military	5.0	4.8	4.6	4.5	4.4	4.4	(0.9)	(4.2)	(2.2)	(2.1)	(0.4)
TOTAL	32.7	37.5	38.8	39.8	40.7	48.9	1.9	3.5	2.6	2.3	1.9
Flight Services											
Pilot Briefs	15.0	10.0	9.4	9.2	8.9	8.1	(5.1)	(6.0)	(2.1)	(3.3)	(1.2)
Flight Plans Originated	8.4	6.2	6.2	6.1	6.0	5.7	(3.3)	0.0	(1.6)	(1.6)	(0.7)
Aircraft Contacted	8.2	4.9	4.6	4.3	4.2	4.0	(6.2)	(6.1)	(6.5)	(2.3)	(1.2)
TOTAL (w/o DUATS)	55.0	37.2	35.8	34.9	34.0	31.6	(4.7)	(3.8)	(2.5)	(2.6)	(1.0)
DUATS	N.A.	12.3	16.2	13.2	14.4	20.2	N.A.	31.7	(18.6)	9.1	1.9
TOTAL (with DUATS)	55.0	49.5	52.0	48.1	48.4	51.8	(0.6)	5.1	(7.5)	0.6	0.0

Source: FY 1985-94; FAA data
FY 1995-2006; FAA forecasts

Note: Two activity levels are shown for 1994 Towered Operations, (1) for the current 402 towered airports and (2) for 352 airports--the new base which removes the 50 airports converted to Contract Towers during 1995.

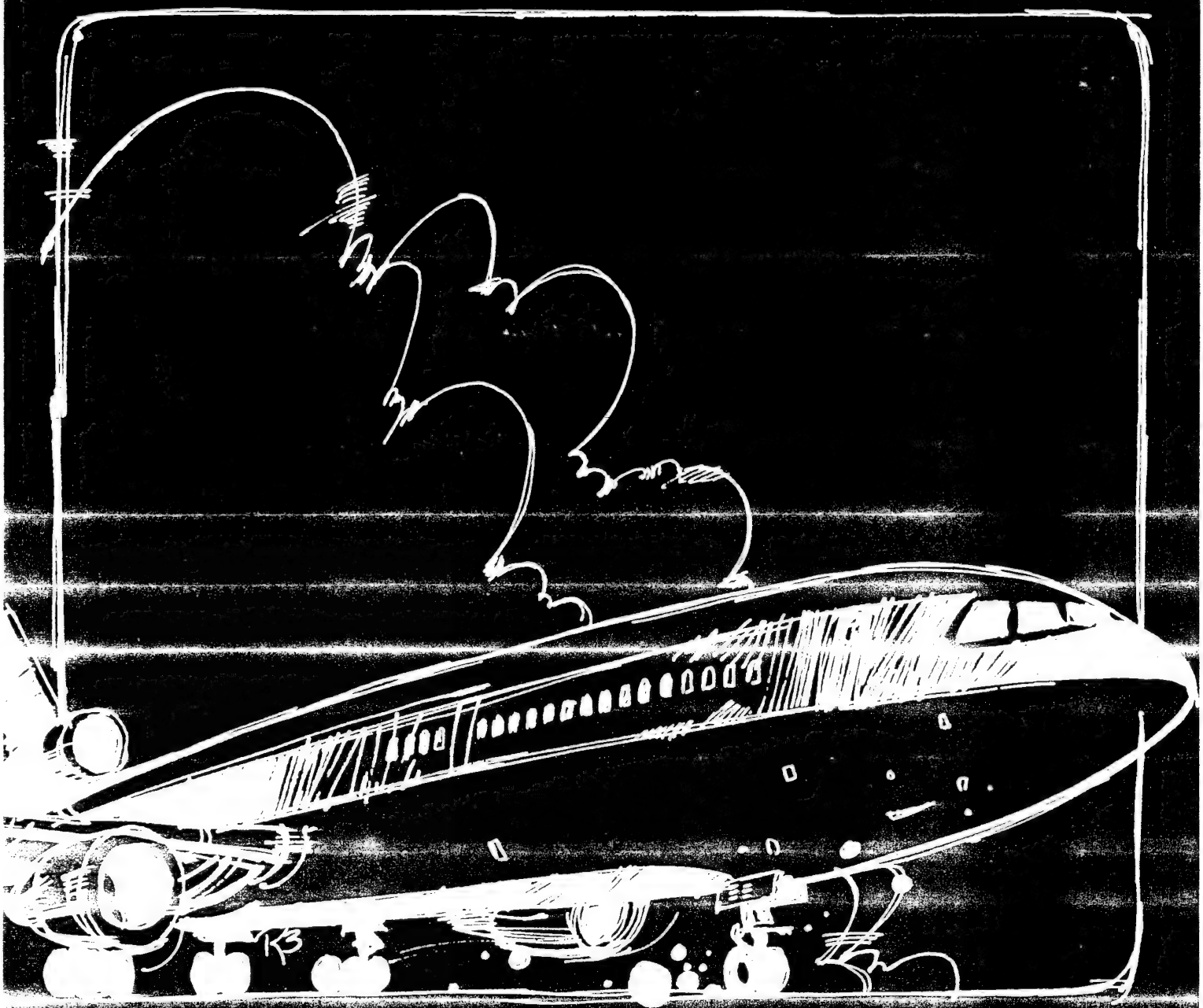
period are as follows: 2.3 versus 1.0 percent at FAA towered airports (352 airports); 2.2 versus 1.0 percent for instrument operations at FAA towered airports; and 2.4 versus 0.7 percent for IFR aircraft handled at FAA air route traffic control centers.

In summary, aviation activity at FAA facilities is expected to grow at a slower rate than the general economy (1.7 percent versus 2.5 percent). Reasons for the disparity between the two rates include the expected continued contraction of military activity, slower growth by general aviation, and the higher load factors, larger aircraft, and longer trip distances flown by commercial airlines.

Air transportation is expected to continue to dominate all other transportation modes in both long distance domestic intercity travel and in international passenger markets. The growth in commuter/air taxi aircraft activity is expected to be somewhat larger than that forecast for the larger commercial air carriers. In addition, the business component of general aviation is expected to achieve somewhat greater growth than that forecast for the general aviation pleasure sector.

CHAPTER III

COMMERCIAL AIR CARRIERS



CHAPTER II

ECONOMIC ENVIRONMENT

REVIEW OF 1994

UNITED STATES

In fiscal year 1994, the economy of the United States continued the expansion begun in 1993, with real gross domestic product (GDP)--the value of all goods and services produced in the nation--growing at a 3.8 percent annual rate. This is up from 3.3 percent growth in 1993. The rate of inflation remained relatively low with the consumer price index (CPI) increasing by only 2.5 percent.

Oil and gasoline prices declined 2.6 percent in 1994 despite a strong worldwide demand for fuel. However, a surge in fuel prices during the last quarter of the fiscal year (July-September) put the oil and gasoline implicit price deflator 7.8 percent above the same 1993 quarter.

The U.S. economy demonstrated surprising strength in the first quarter of fiscal year 1994, growing 6.3 percent. Each succeeding quarter grew by 3 percent or more. Consumers have continued to display confidence throughout the year. Housing markets have also remained strong, resisting the upward surge in mortgage rates. Likewise, businesses have continued to increase their spending on capital goods.

Unemployment has fallen below 6 percent, and currently stands at 5.4 percent in December. Nonfarm employment rose at a rate of more than 3 percent during the last two quarters of the fiscal year, with a rise of 3.2 percent in the 4th quarter.

The continued rise in short-term interest rates, in combination with reductions in Government spending, is expected to limit short-term economic growth to a rate which does not provoke significant price inflation. The Federal Reserve has boosted short-term interest rates (Treasury bill rate) from 3.06 percent to 4.48 percent over the past year. While reduced Government spending is expected to strengthen the economy in the long-term, the reductions can have a negative impact in the short-term. Federal Government spending has declined by about 2 percent over the past year.

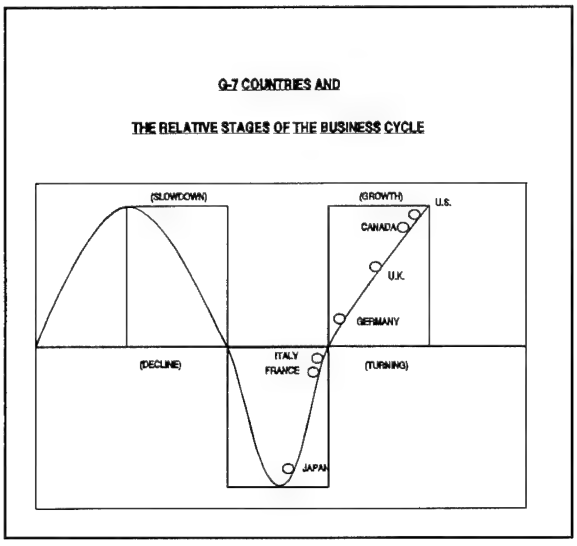
WORLD

The world's economies strengthened significantly in calendar year 1994. The combined world economies grew by 2.1 percent in 1994 compared to an expansion of only 1.1 percent in 1993. Most world economies appear to be well along in the recovery/growth stage of the business cycle.

Developing countries in the regions of the Pacific Basin (up 7.1 percent) and

in the Middle East (up 4.6 percent) had the highest combined GDP growth rates in 1994. Among the developed countries, Australia and New Zealand each experienced over 4 percent growth in 1994. The U.S. and Canadian economies grew by 3.6 and 3.8 percent, respectively. Western European countries reported a combined growth rate of 2.3 percent.

All of the developed economies, as represented by the G-7 nations (United States, Canada, United Kingdom, Germany, Italy, France, and Japan) are either in the recovery or growth phase



of their economic cycles. The economies of the United States, Canada, and the United Kingdom are well into the latter stages of the growth stage, while the Western Europe trio of Germany, Italy, and France are just beginning to enter the growth phase of the business cycle. Japan continues to lag the other G-7 nations, having just entered the recovery stage of the economic cycle.

Inflation caused only limited concern among the major industrialized countries in 1994. Italy, with a rise of 3.9 percent, had the highest inflation rate while Canada and Japan reported inflation rates of only 0.1 and 0.6 percent, respectively.

The appreciation of the Japanese yen against the U.S. dollar of about 6.5 percent brought the yen above the important psychological penny-yen parity point. Likewise, the German mark and the British pound rose against the dollar, up 5.3 and 2.7 percent, respectively.

U.S. ECONOMIC OUTLOOK

The economic projections used in developing the FAA Baseline Aviation Forecasts for the period 1995 to 2000 was provided by the Executive Office of the President, Office of Management and Budget (OMB). For the period 2001 to 2006, the economic scenario uses consensus growth rates of the economic variables prepared by DRI/McGraw-Hill. Inc. (DRI), Evans Economics, Inc. (Evans), and The WEFA Group. All of the indices presented here have a single base year, except for the Consumer Price Index. The Bureau of Labor Statistics has based the CPI index on an average of the 1982 through 1984 time period.

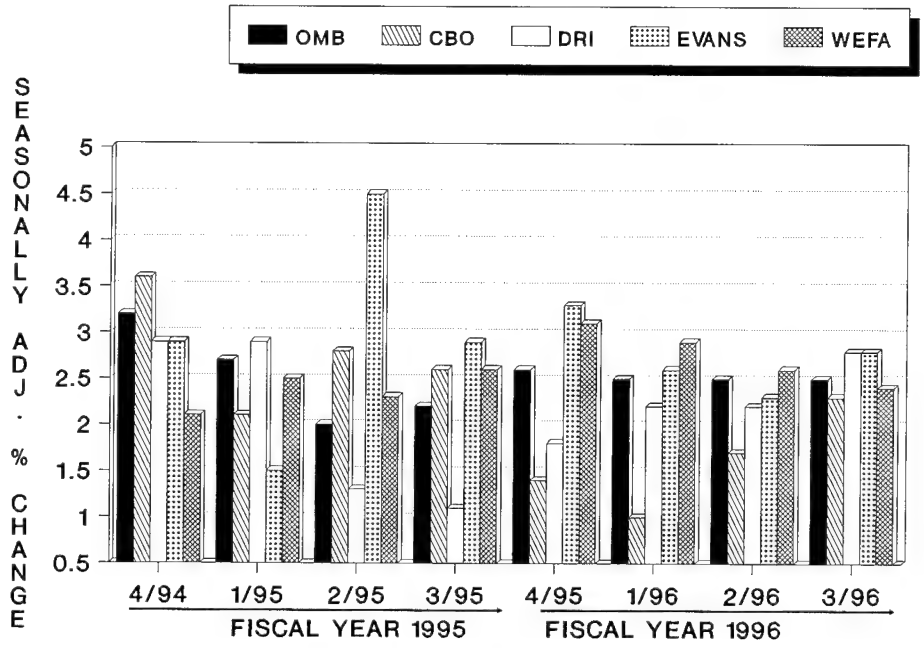
The principal series used in the individual aviation models to develop the FAA aviation forecasts are discussed in the following pages. The data are presented in tabular form in Chapter IX, Tables 1 through 5.

SHORT-TERM ECONOMIC OUTLOOK

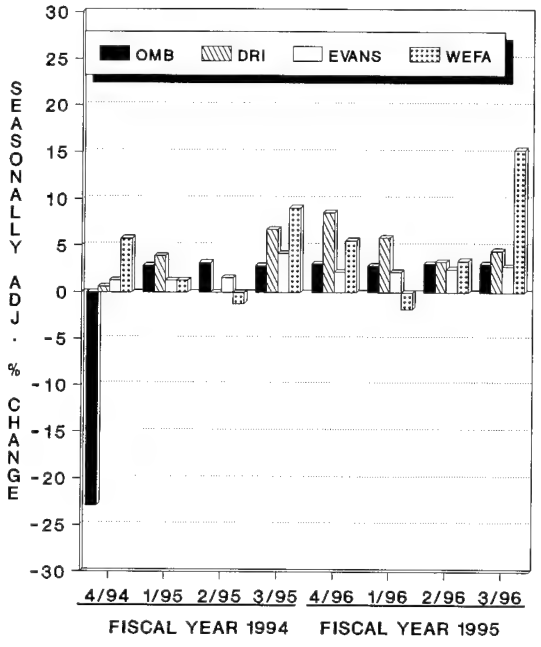
The U.S. gross domestic product rose 3.8 percent in real terms in fiscal year 1994, continuing a sound recovery from the 1990-92 economic slump. However, the strong economic activity exhibited in both 1993 and 1994 is ex-

U.S. SHORT-TERM ECONOMIC FORECASTS

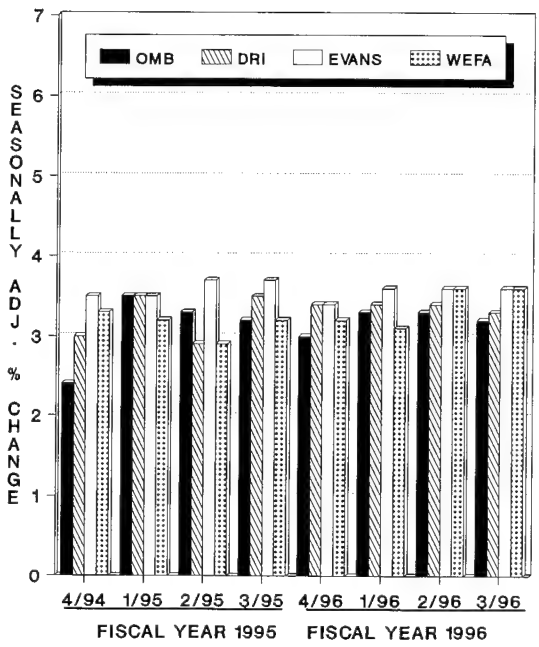
REAL GROSS DOMESTIC PRODUCT



OIL AND GAS DEFLATOR



CONSUMER PRICE INDEX



pected to moderate somewhat over the next several years.

The U.S. economy is expected to continue to exhibit relatively strong growth in 1995, with real GDP forecast to grow by 3.1 percent. However, a large part of this growth is projected to occur during the first quarter (up an annualized rate of 3.2 percent), with growth tapering off to about 2 percent during the latter two quarters of the year. GDP is projected to grow by a more moderate 2.4 percent in 1996.

Prices, as measured by the CPI, are forecast to rise by 3.0 percent in 1995 and 3.2 percent in 1996. Oil and gas prices are not expected to add to inflationary pressures, with prices projected to decline 5.2 percent in real terms over the next 2 years. In current dollars, oil prices are forecast to decline 1.9 percent in 1995, then rise by 3.0 percent in 1996.

LONG-TERM ECONOMIC OUTLOOK

The long-term outlook for the U.S. economy is real GDP growth averaging 2.5 percent over the next 12-year period. Long-term growth is determined by demographic forces, growth in productivity, and nation's stock of capital goods. The U.S. labor force is expected to increase by about 1.4 percent annually over the forecast period. In addition, capital formation should increase at an annual rate of 2.9 percent. However, much of the investment will be to replace existing stock.

Inflation is expected to remain in the moderate range for the 12-year forecast period. The CPI is forecast to increase by 3.1 percent annually for the first half of the forecast period and to average 3.5 percent over the entire forecast period. Oil and gas prices are projected to increase at a rate below the rate of inflation (up 2.2 percent) during the first half of the forecast period. Over the entire 12-year period, nominal fuel prices are forecast to increase at an average annual rate of 3.3 percent. Real fuel prices decline 0.2 percent annually over the same time period.

WORLD ECONOMIC OUTLOOK

The principal series used in developing the FAA aviation international forecasts are discussed in the following pages. These data are presented in tabular form in Chapter IX, Tables 4 and 5. Exchange rates for individual countries and GDP for individual, as well as groups of countries, were obtained from WEFA's World Economic Outlook. These data are for calendar years and are expressed in 1985 U.S. dollars.

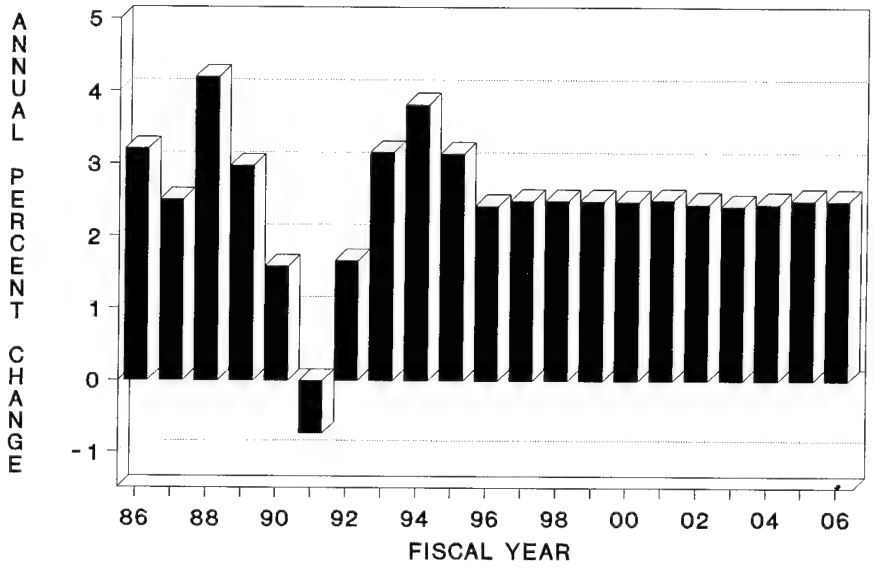
GROSS DOMESTIC PRODUCT

The graph on page II-6 depicts the historical trend and forecast GDP growth for the world and major economic regions of the world. World economic growth is expected to pick up its pace in 1995 with an anticipated growth of 3.8 percent compared to growth of only 2.1 percent in 1994. The annual growth rate for world GDP over the 12-year forecast period equals 3.9 percent. The total goods and services produced in the world (measured in 1985 U.S. dollars) is projected to rise from $16.4 trillion in 1994 to a level of $25.8 trillion in 2006.

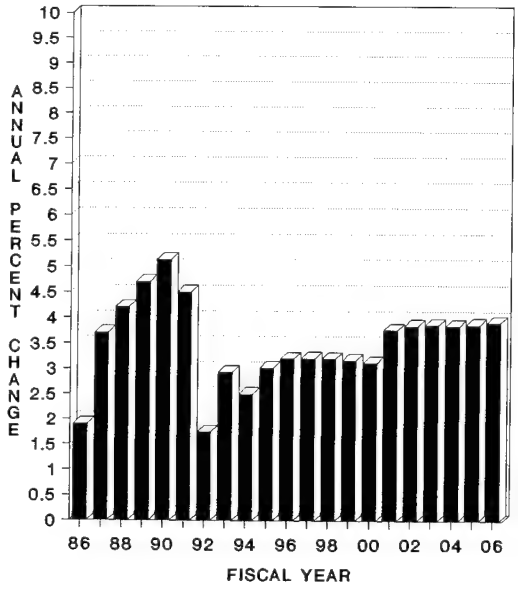
After a relatively slow start (up 2.3 percent in 1995), the Japanese economy, which makes up two-thirds of the region's economic output, is fore-

U.S. LONG-TERM ECONOMIC FORECASTS

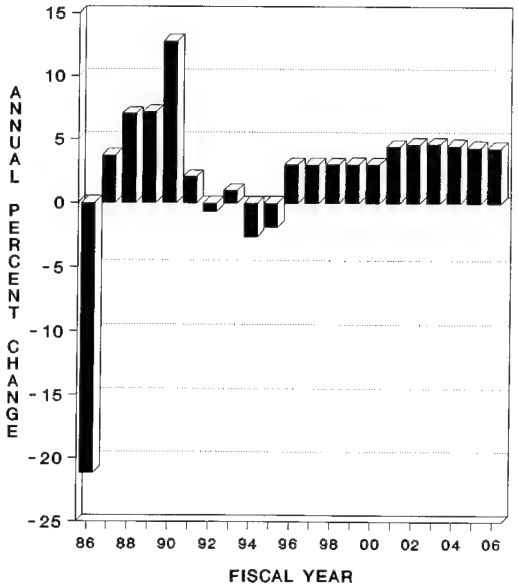
GROSS DOMESTIC PRODUCT
(1987 DOLLARS)



CONSUMER PRICE INDEX
(1982-84$)

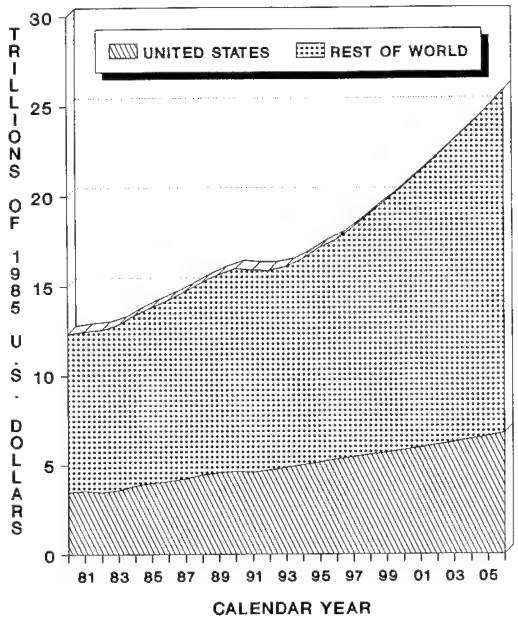


OIL AND GAS DEFLATOR
(1987= 100)

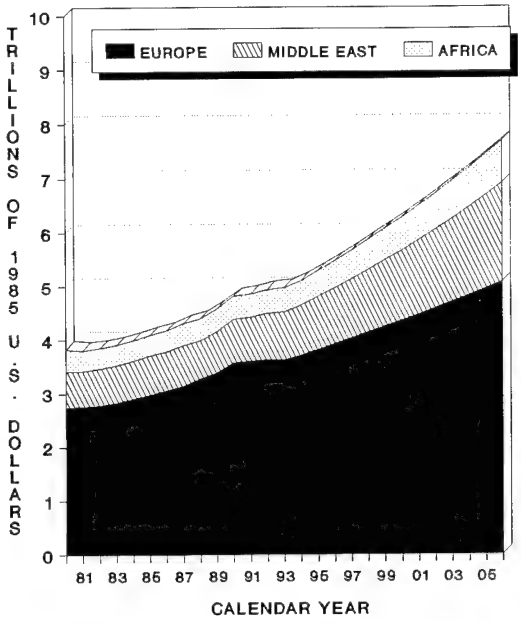


GROSS DOMESTIC PRODUCT BY WORLD REGION

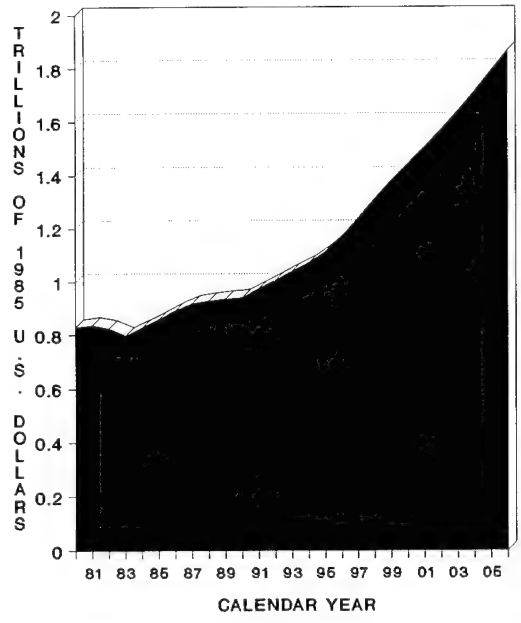
WORLD



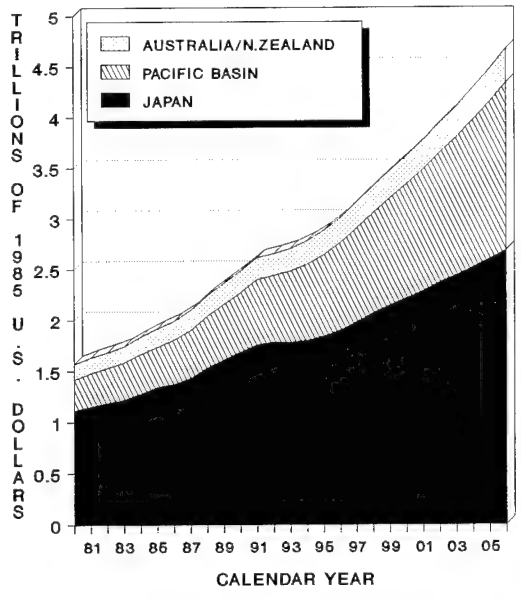
EUROPE/MIDDLE EAST/AFRICA



LATIN AMERICA



JAPAN/PACIFIC BASIN/ AUSTRALIA/NEW ZEALAND



cast to grow at an annual growth rate of 3.3 percent over the 12-year forecast period. Major risks for the Japanese economy come from internal political uncertainties and the continued strengthening of the yen.

The Pacific Basin (which includes Japan, the newly industrialized and developing nations of Asia Pacific, Australia, and New Zealand) is expected to continue to show strong economic growth throughout the forecast period. The region's GDP is forecast to increase at an average annual rate of 4.4 percent over the forecast period.

The economies of Pacific Asia (which includes only the Asian countries of the Pacific Basin) are expected to continue to develop at rates exceeding most of the world's economies, with the combined GDP expanding at an annual rate of 6.6 percent. The specific issues affecting the growth of this geographic region vary from country to country. However, political instability and the lack of adequate infrastructure plague most of the nations of this region.

Latin America, as an economic region, is expected to demonstrate considerable strength over the forecast period. GDP in the region is projected to increase by 4.2 percent in 1995 and to average 4.7 percent annual growth over the entire forecast period. A positive economic influence will come from economic integration of the countries of the region. For instance, an agreement among Argentina, Brazil, Paraguay, and Uruguay (referred to as the Mercosur) is expected to benefit each the countries through enhanced trade. Additionally, Mexico's trade with the United States, which will continue to grow under the NAFTA, will help expand economic growth throughout the region.

Economic growth in the region which includes Europe, the Middle East and Africa is projected to average 3.5 percent annually over the forecast period. Europe, which makes up approximately 60 percent of the region's economic output, is expected to achieve somewhat slower economic growth than the other countries that make up the region, averaging 2.6 percent growth over the forecast period. Europe is experiencing the nagging economic problem of extremely high unemployment, which appears to be structural in nature. Existing large government budget deficits limit the use of traditional fiscal and monetary policy to deal with the problem.

Low fuel prices, combined with a growing supply of oil, are expected to further dampen fuel price rises as well as constrain economic growth in the oil producing countries of the Middle East. Africa remains an economic region which is almost totally dependent on the export of its commodities.

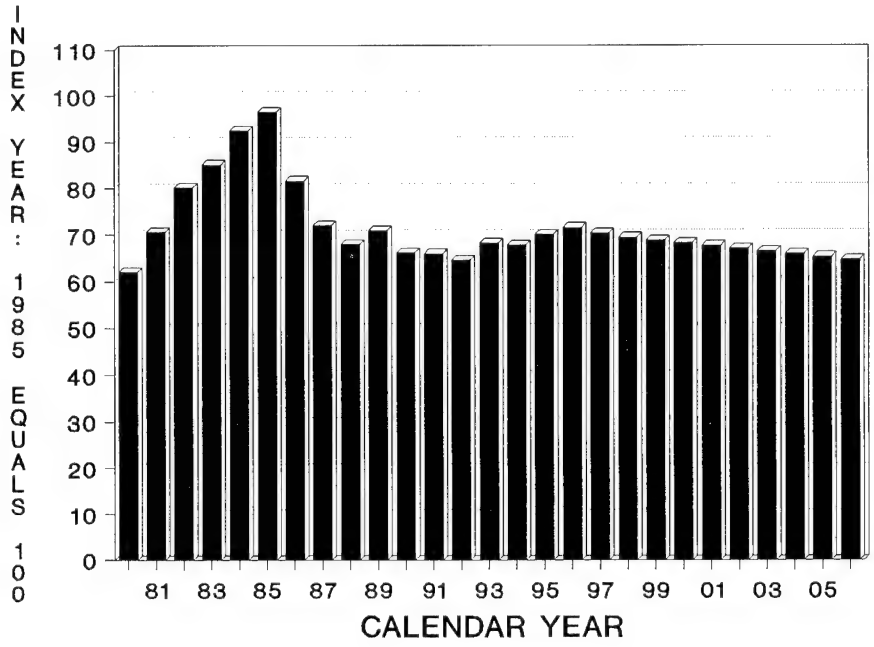
DOLLAR EXCHANGE RATE

The chart on the following page shows historic and forecast values for the U.S. effective exchange rate and the exchange rates for both the Japanese yen and the German mark. The effective U.S. exchange rate measures the purchasing power of the U.S. dollar on the world's markets, taking into account both the amount of trade the U.S. conducts with other countries as well as price differences.

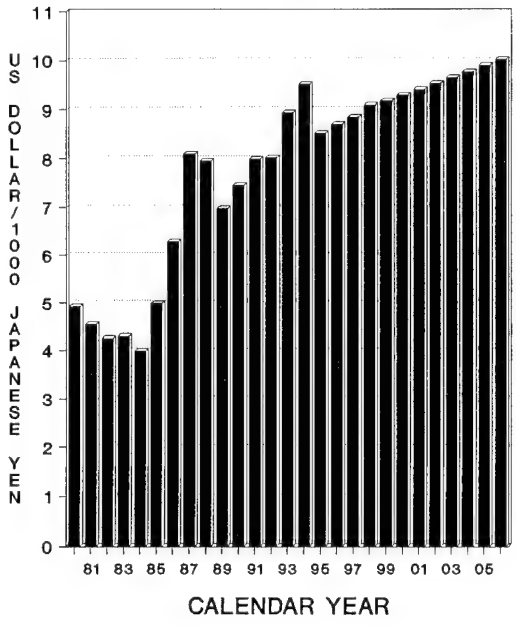
The purchasing power of the U.S. dollar relative to the rest of the world is somewhat weaker than during the mid-1980s and is forecast to remain at its present level for much of the forecast period. The value of the U.S. dollar versus the yen is expected to increase 10.6 percent in 1995, then depreciate (2.9 percent annually) over remainder of the forecast period. The German mark is projected to depreciate against the U.S. dollar in 1995 (down 8.8 percent), appreciate at an annual rate of 1.9 percent through 1999, then decline

EXCHANGE RATE TRENDS AND FORECASTS

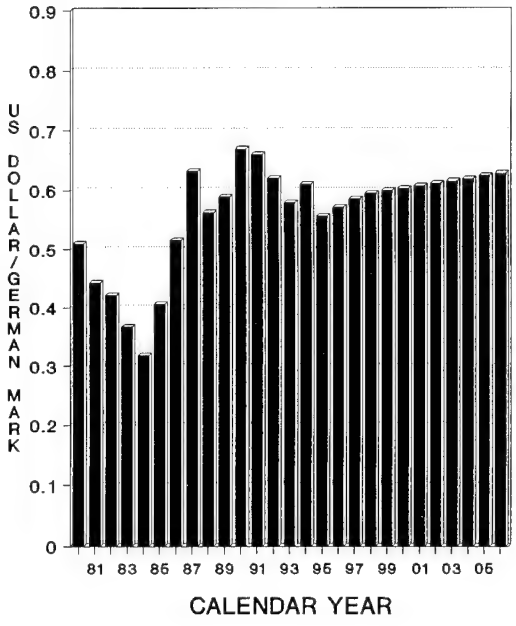
U.S. EFFECTIVE EXCHANGE RATE



JAPANESE YEN



GERMAN MARK



(1.2 percent annually) over the remainder of the forecast period.

A CLIMATE FOR GROWTH

With the U.S. economy in full bloom and with only a few apparent negative influences on the horizon, the climate appears suitable for continued economic growth. The potential reduction in federal taxes and/or regulatory burdens should help to structure a healthy long-term U.S. economy.

THE SHORT-TERM VIEW

The economic forecasts used to project future aviation activity have not factored in the potential impact of the tax cuts and other changes proposed by the Clinton Administration. The potential impact of these actions is largely unknown at this time since the likely size and direction of these changes have not been determined. However, any changes in taxes or government spending would probably not have any immediate impact until the later part of 1995 or later.

Another factor which could impact the economy is the expected increase in the short-term interest rates by the Federal Reserve. The consensus is that the Federal Reserve appears poised to raise short-term interest rates by about one-half percentage point in early 1995.

The present expansion dates from the spring of 1991, meaning that the U.S. economy is more than three and half years into the recovery cycle. The average post war recovery lasted just three and half years. Exceptions to length in the economic growth-cycle occurred in the 1960s and 1980s, periods when the Federal government provided strong fiscal stimulus--the first due to the combination of the "Great Society" spending and the Viet Nam War and the second due to an arms build up during the 1980s. At present, the Federal government's stated goal is to reduce the Federal deficit, thus providing a negative impact to income growth.

A favorite expression currently used among economic forecasting services is that of a "soft landing" for the economy. This means that economic growth is reduced somewhat, but negative growth or recession is escaped. This can occur when some sectors of the economy cushion the decline in the interest-sensitive aspects of the economy. Since government is expected to continue to decrease its spending over the next 18 months, the cushion could come from export trade and non-residential construction.

The outlook for consumer income and spending appears bright for near future. Unemployment has fallen well below the 6 percent mark and consumer confidence in 1994 has remained at its highest sustained level since 1989. Real consumer spending is expected to rise between 2 and 3 percent in both 1995 and 1996. Savings rates are forecast to remain at about their present level of 4 percent.

Business investments are expected to moderate over the next 18 months. Fixed business investments in equipment are forecast to reduce their level of growth from the current 12 percent rate to about 8 percent in 1995 and 3 percent in 1996. Business inventories rose by about 5 percent in 1994. Since businesses cannot be expected to sustain such accumulation, the slowdown in inventory buildup could place a drag on the economy during the coming year.

The Federal budget deficit fell by $52 billion in 1994. This reduction, the result of the 1993 Omnibus Budget

Reconciliation Act (OBRA) and an expanding economy, is derived from a $116 billion increase in tax receipts offset by a $54 billion rise in government expenditures. Under existing laws, the budget deficit should continue to decline in 1995.

Prices and wages experienced only moderate rises in 1994, with unit labor costs moving up by 1.2 percent and CPI rising only 2.5 percent. However, low unemployment rates and high manufacturing capacity utilization rates are expected to put upward pressure on prices. In addition, labor costs will likely increase as productivity gains slacken due to a slowdown in output growth. Per unit labor costs are forecast to rise by about 3 percent in 1995 with the CPI rising at about the same pace. Overall the level of inflation appears moderate over the next 18 months.

The Federal Reserve, acting as central banks normally do in this phase of the business cycle, raised interest rates throughout 1994. Short-term interest rates rose six times during the year as a result of the Federal Reserve actions. Short-term interest rates, as measured by the 90-day Treasury bill, rose from the level of 3.01 percent in October 1993 to 5.02 percent in October 1994. During the same period, long-term rates, as measured by the 30-year government bond rate, rose from 5.93 to 7.96 percent.

The upward ratcheting of interest rates by the Federal Reserve is expected to continue as long as the U.S. economy continues to appear expansive. A rise in the short-term rates of another half percent is expected in January. Long-term bond rates could move up an addition half point as investors react to potential inflationary factors resulting from a growing economy.

THE LONG-TERM VIEW

The long-term economic forecast depends on many factors, but three areas of consideration should shed light on future prospects for growth. Changes in U.S. labor productivity, the opening up of trade throughout the world, and potential change in taxes and government spending each will have a major impact on long-term U.S. economic growth.

Three factors determine the productivity of the population: education and/or skills, productive capital, and technology. Productivity growth over the forecast period is expected to average 1.2 percent annually. The U.S. population is projected to grow at a rate of about 0.9 percent annually for most of the forecast period. Much of the growth will result from an expansion of an aging population. During the period, the growth in the labor force should average 1.4 percent annually. Combined with technological improvements, labor force and productivity gains should afford the U.S. economy a 2.5 percent average annual growth over the forecast period.

Potential major changes in federal government spending and programs make the long-term view of the government sector somewhat uncertain. However, we expect that the government sector will continue to decline as a proportion of real GDP. The economic forecasting services predict that total government spending, including Federal and state and local government, will decline from 17.4 percent in 1994 to 15.4 percent in 2006.

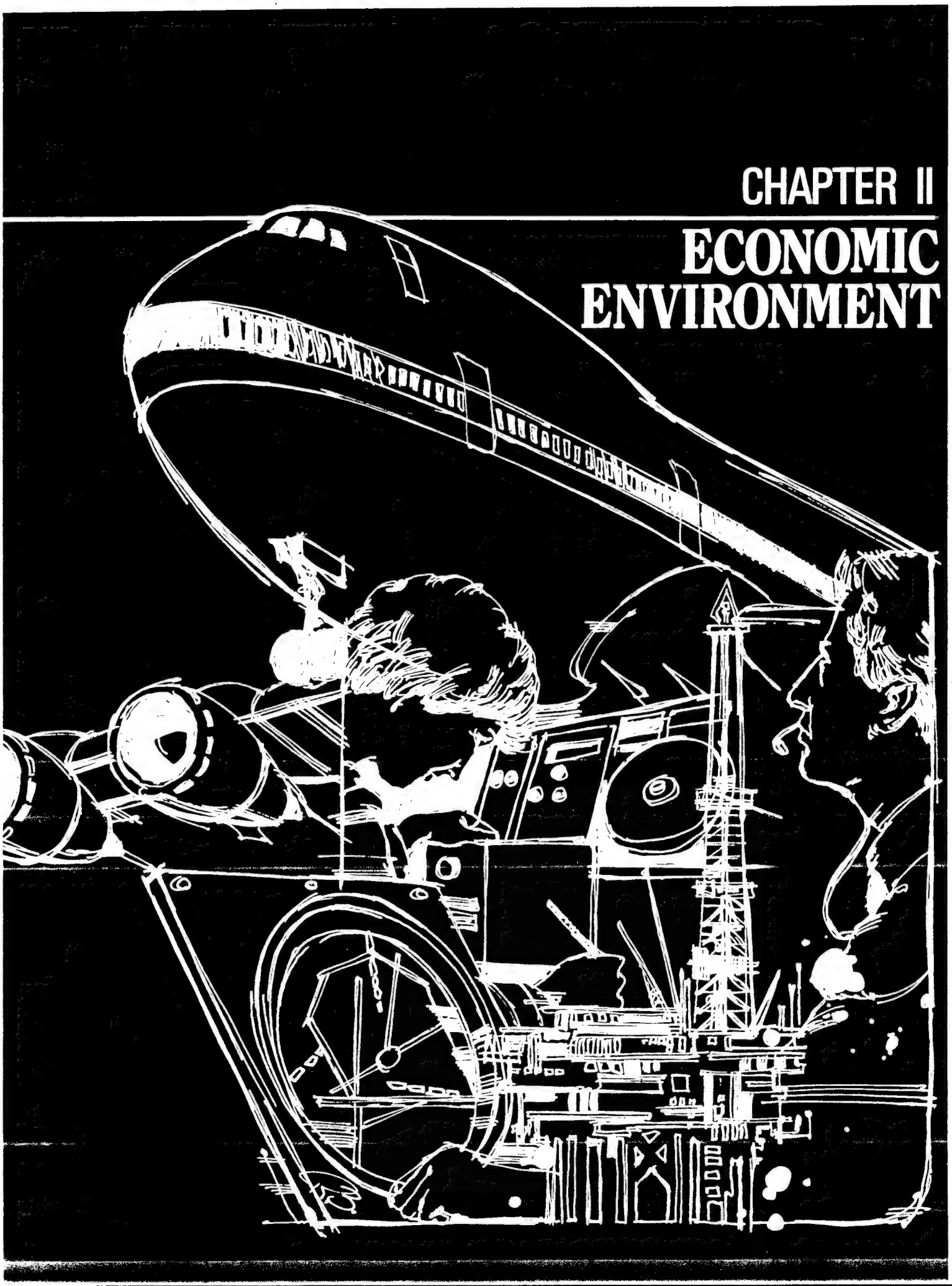
The steady growth of world economies and the opening up of trade with the rest of the world will have a positive influence on U.S. export growth. The world's economies, excluding the United States, should grow at a rate of about 4.5 percent annually over the forecast

period. Since many of these countries import U.S. goods, their growth will add to U.S. export growth. The recent approval by the U.S. Congress of the General Agreement on Tariffs and Trade and last year's agreement on the North American Free Trade Agreement should help to assure healthy export industries through the forecast period.

IMPACT ON AVIATION

Both the domestic and international forecasts present an optimistic outlook for U.S. commercial aviation. The short and long-term economic growth in the United States and the world, along with the anticipated decline in real fuel prices, gives rise to a positive climate for the aviation industry.

On average, air travel increases at a rate proportionately more than the rise in income. Hence, the expected 3.1 percent growth in U.S. GDP in 1995 is expected to result in an even greater response by air travelers. In a similar manner and, to some degree even more so, the expansion of economic activity in other regions of the world will improve international travel beyond the levels of the rise in income.



CHAPTER II
ECONOMIC ENVIRONMENT

CHAPTER III

COMMERCIAL AIR CARRIERS

In fiscal year 1994 there were 75 U.S. commercial airlines (both scheduled and nonscheduled) reporting traffic and financial data to the Research and Special Programs Administration (RSPA), Department of Transportation (DOT), on Form 41. There were 53 passenger airlines (operating aircraft with over 60 seats) and 22 all-cargo carriers. While there are more carriers this year than last, additions are primarily in the nonscheduled segment of the industry.

Thirty-nine of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Thirty-five of the carriers provided scheduled domestic service (within the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 20 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, 10 served Atlantic routes, 10 served Latin American routes, and seven served Pacific routes.

A list of domestic and international commercial passenger and cargo air carriers active in fiscal year 1994 is in Appendix A. A listing of inactive commercial passenger and cargo air carriers is in Appendix B.

Air carrier traffic forecasts and assumptions discussed herein are presented in Chapter IX (Tables 6 through 17). FAA air carrier workload forecasts are discussed in Chapter VII and presented in Chapter IX (Tables 27 through 37).

REVIEW OF 1994

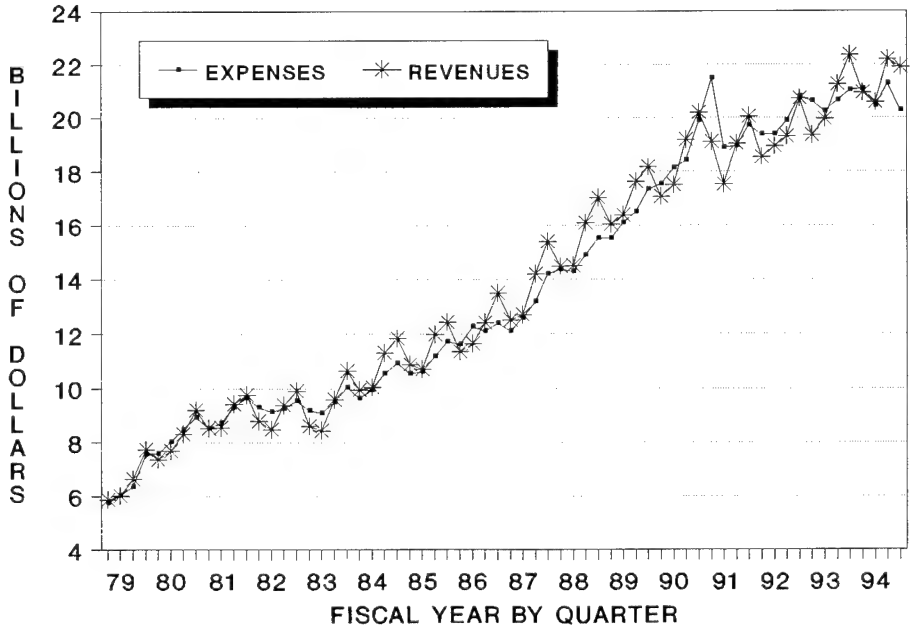
FINANCIAL RESULTS

Fiscal year 1994 financial performance of the U.S. commercial airline industry showed significant improvement over 1993. The U.S. economy continued to expand in 1994, along with the key economies in Europe, Asia, and Latin America. Essentially, financial improvement was based on capacity control and strong growth in traffic. Fare competition remained strong with both nominal and real yields showing significant declines over 1993. The industry managed to slow the growth of capacity during the year, which pushed domestic and international load factors to all time highs.

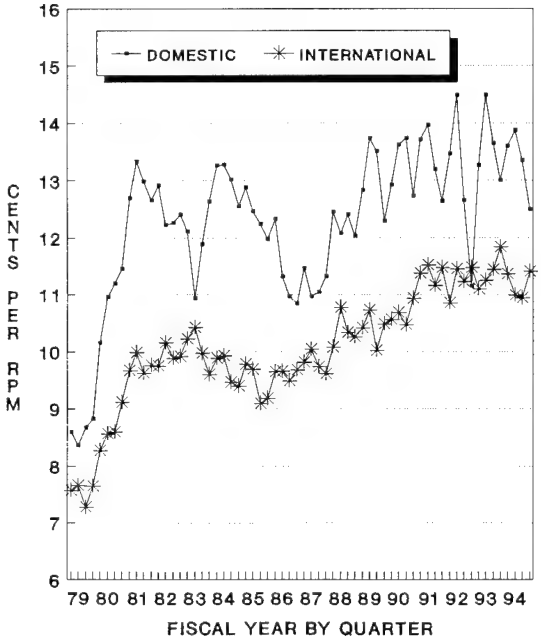
Operating profits in 1994 were more widespread than in 1993. In 1994,

U.S. AIR CARRIER REVENUE AND COST TRENDS

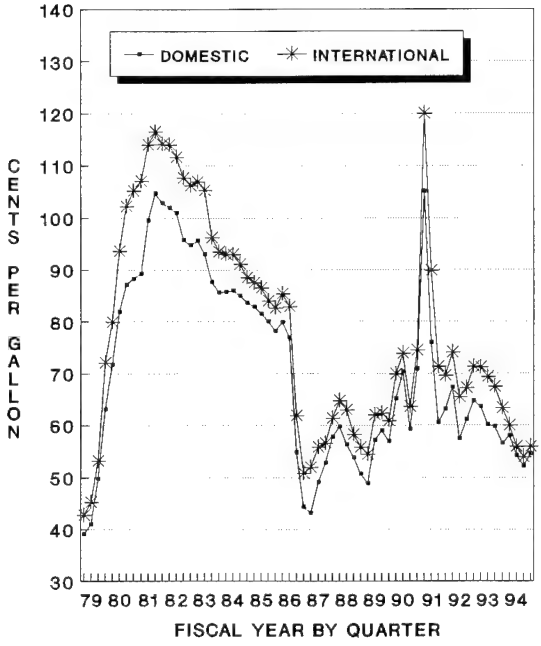
OPERATING REVENUES AND EXPENSES



PASSENGER YIELDS

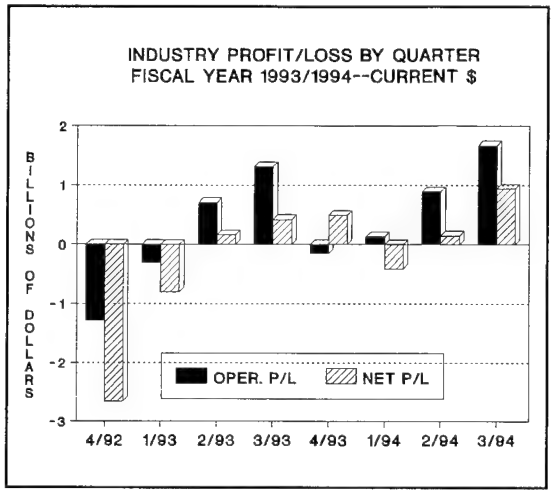


JET FUEL PRICES



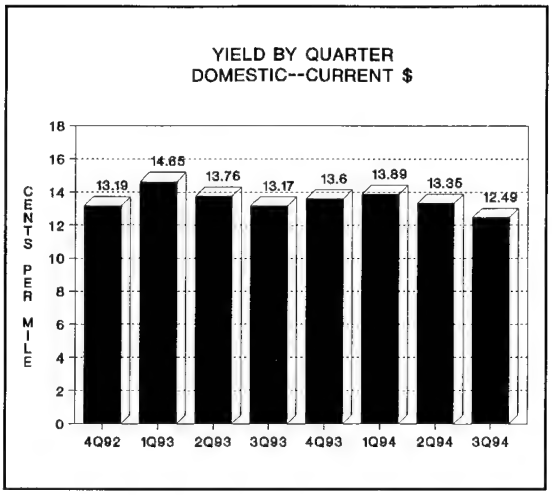
(ALL VALUES IN CURRENT DOLLARS)

seven out of the eleven major carriers in the industry made an operating profit. The shift in operating profit between the years 1993 and 1994 was over $2.3 billion. The industry operating profit in 1993 was only $324 million, while 1994 had a operating profit of over $2.6 billion.



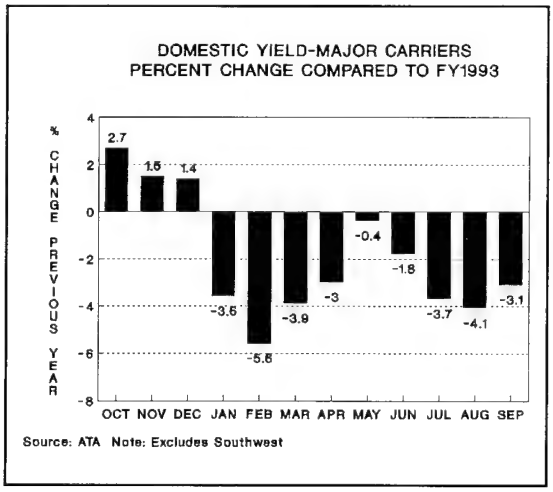
While the industry experienced an operating loss in the last quarter of 1993, it saw an operating profit in each of the remaining quarters of 1994. The second and third quarters of the year have historically been profitable for the airline industry. Since 1982, there were profits in the second and third quarter in every year but 1992.

An important financial change for the year was the decline in yields for the major carriers and the industry. Yields dropped during the last three quarters of fiscal year 1994.

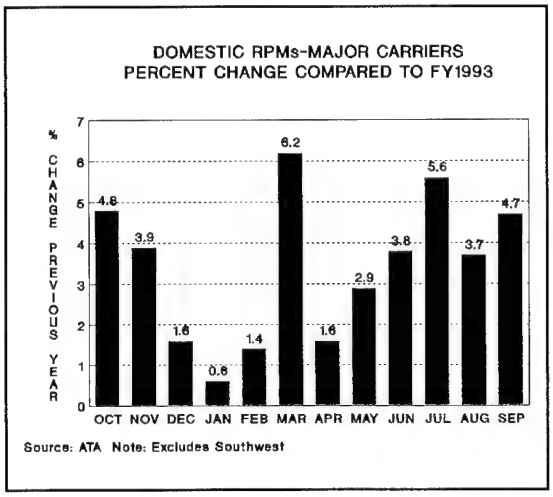


Although yields were down during most of the fiscal year, traffic (and passenger revenues) were up, with increases in traffic recorded in every month of the fiscal year.

The dynamic situation with respect to yields and RPMs is shown in the following two graphs. Domestic yield increased in the first quarter of fiscal year 1994, and then declined continuously from January 1994 through September.



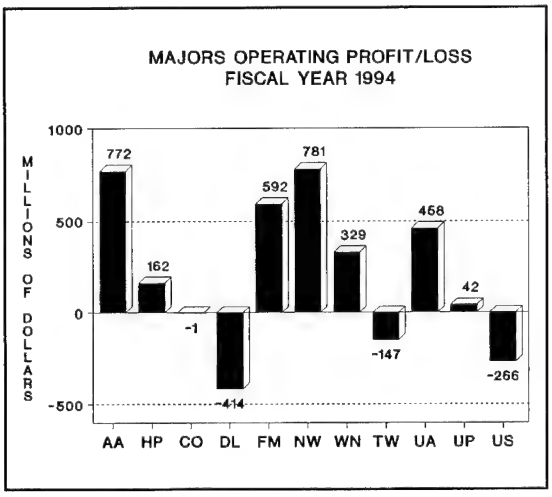
The graph below shows RPMs, which increased in every month through the fiscal year. On average during the fiscal year, domestic traffic was up approximately 6.5 percent while average nominal yield was down about 2.6 percent. Although competitive pressures continued to push yields downward, the growth in domestic traffic was large enough to have passenger revenues increase during every quarter of fiscal year 1994.

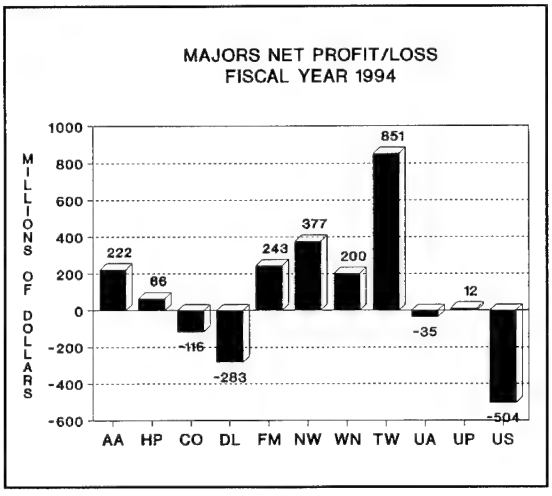


The international air travel sector, after recording a traffic (RPM) increase of 4.9 percent in 1993, grew only 2.8 percent in 1994, due to a slow growth in the Pacific market. International yields decreased 2.4 percent in current dollar terms, and 4.8 percent in real dollars.

U.S. airlines posted a net profit of almost $1.2 billion in fiscal year 1994, a substantial gain over the $2.9 billion net loss in 1993. However, a large percentage of the net profit is attributable to TWA's onetime write-off of $908 million of debt in November 1993. This is the first net profit recorded by the industry during the past four fiscal years. During fiscal year 1991 the industry's net loss was over $4.6 billion, and in fiscal year 1992 the net loss was approximately $2.3 billion.

The following two graphs show operating profit and loss and net income for the air carriers classified as majors. Both of the cargo airlines made an operating profit. Seven major airlines showed an operating profit in fiscal year 1994, compared to six in fiscal year 1993. Of the nine passenger airlines, five showed an operating profit while four showed a loss. Delta showed the greatest operating loss at about $414 million, and was the only carrier to have a greater loss in fiscal year 1994 than in 1993.





During the next several years intense competition within the industry will continue to push real fares downward. However, falling fares along with

modest to strong growth in the economy will continue to expand aviation activity and increase passenger revenues. The industry is also undergoing major structural changes in an attempt to control and reduce operating costs. If they are successful, we can expect operating profits to continue to improve in the short- and long-term. The current forecast assumes declining real fares, and continued strong growth in aviation activity. This would allow for industry financial improvement in fiscal year 1995 and beyond, if costs can be brought under control.

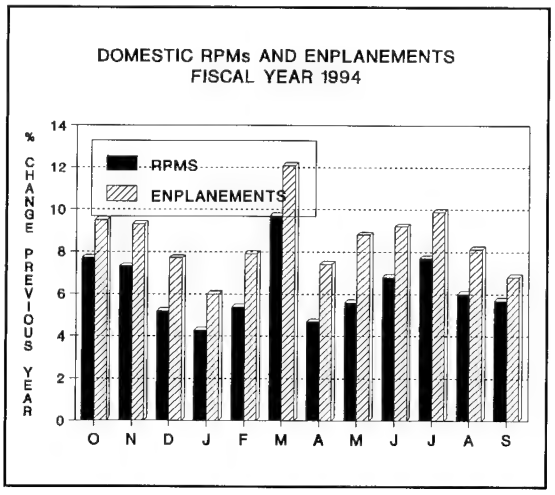
SCHEDULED PASSENGER TRAFFIC AND CAPACITY

Scheduled system (domestic and international) passenger traffic on U.S. commercial airlines showed significant growth in 1994. System demand for air travel (as measured in RPMs) increased 5.5 percent. This follows 1993's increase of only 1.7 percent. The increase in passenger demand in 1994 was almost entirely due to an increase in domestic RPMs, as there was only a moderate increase in international RPMs in 1994. While total international travel has been rebounding from the depressed levels of 1991, the growth has been relatively slow, mostly due to a continuing decline in Pacific traffic. In 1994, total international RPMs increased a modest 2.8 percent.

System available seat miles (ASMs) increased 0.9 percent, resulting in a system load factor of 65.8 percent, up significantly from 1992's record high level of 63.7.

Domestic Passenger Traffic and Capacity

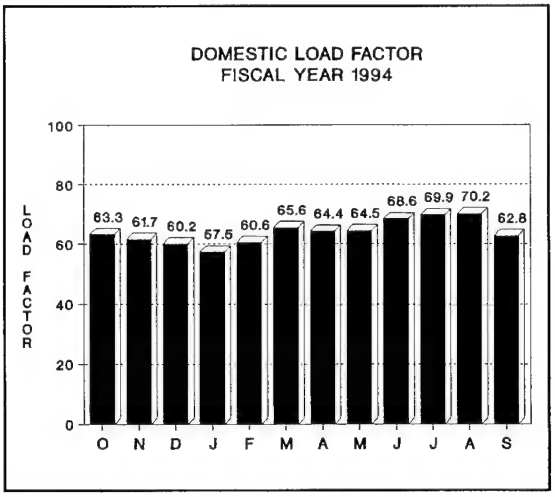
Domestic RPMs increased 6.5 percent in fiscal year 1994 to 371.4 billion. This outcome was largely the result of the relatively strong growth in the economy and the continued decline in real yields. As shown in the graph, traffic was up in every month comparing 1993 with 1994. Domestic passenger enplanements (472 million) increased by 8.7 percent in fiscal year 1994; in 1993 the increase was only 0.9 percent.



Real yields decreased by 5.0 percent in 1994, which is significantly greater than the average decline of approximately 1.9 percent experienced since deregulation. This decline was expected, since intense competition continues on many routes, and carriers continue to pare unit costs.

As shown previously, yields of the major carriers continuously declined from January 1994 through September. The largest decline was experienced in February (-5.6 percent) and the smallest in May (-0.4 percent). Historically, yields tend to increase during the summer months. However, heightened competition on many routes continues to depress fares. Looking at yield on a quarterly basis, domestic

yield declined from 13.88 cents in the first quarter of 1994 to 12.48 cents in the third quarter of 1994--a drop of over 10.0 percent.



Domestic capacity increased by only 1.6 percent in fiscal year 1994. This increase, along with an increase in RPMs of 6.5 percent, resulted in a load factor of 64.3 percent--the highest ever achieved on domestic routes. The previous high of 63.0 percent was achieved back in 1979.

Industry concentration, in terms of the percentage of RPMs carried by the three largest carriers, decreased in 1994. American, United, and Delta's share of RPMs declined to 53.1 percent in 1994, down from 55.5 percent in fiscal year 1993. The share for these three carriers is expected to decrease in the short-run due to possible downsizing and the strong growth of the new-entrant low-cost carriers.

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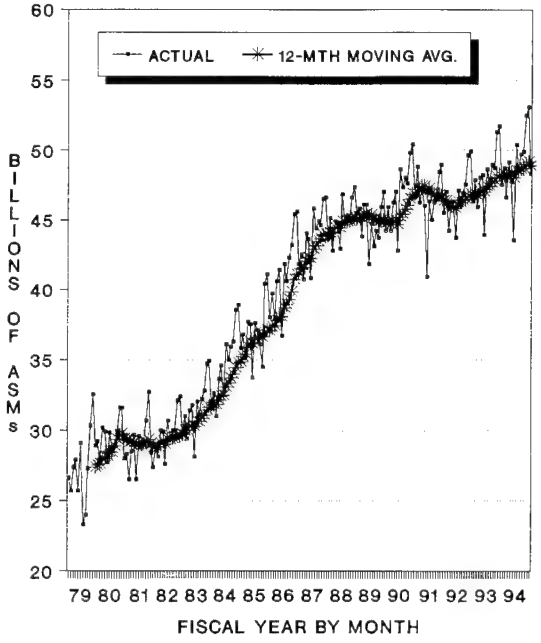
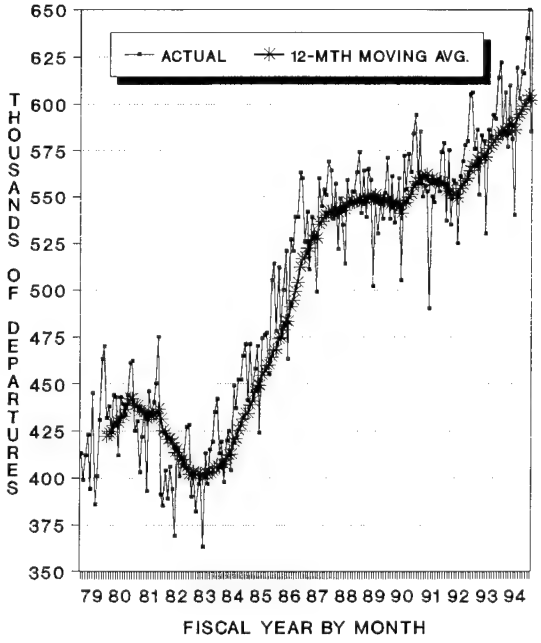
U.S. AIR CARRIER DOMESTIC TRAFFIC TRENDS

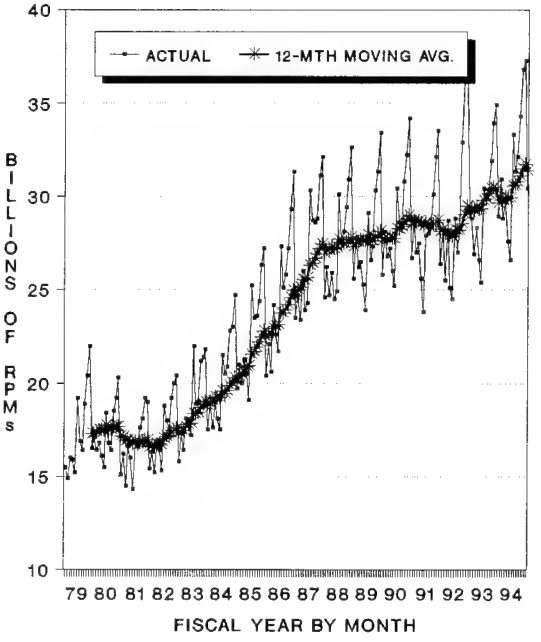
AVAILABLE SEAT MILES



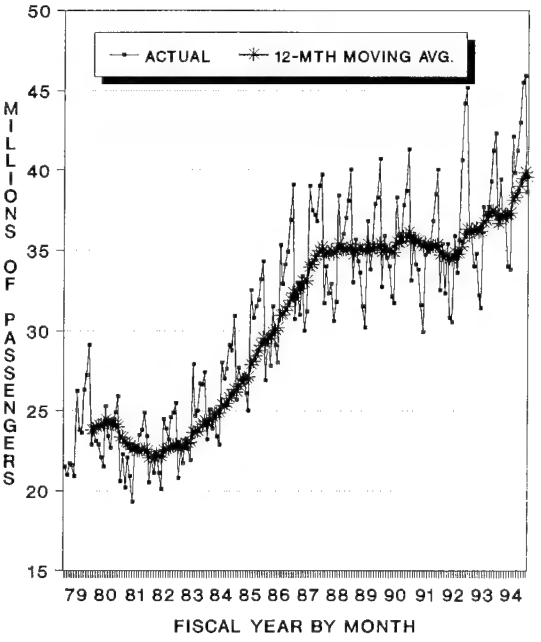
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES

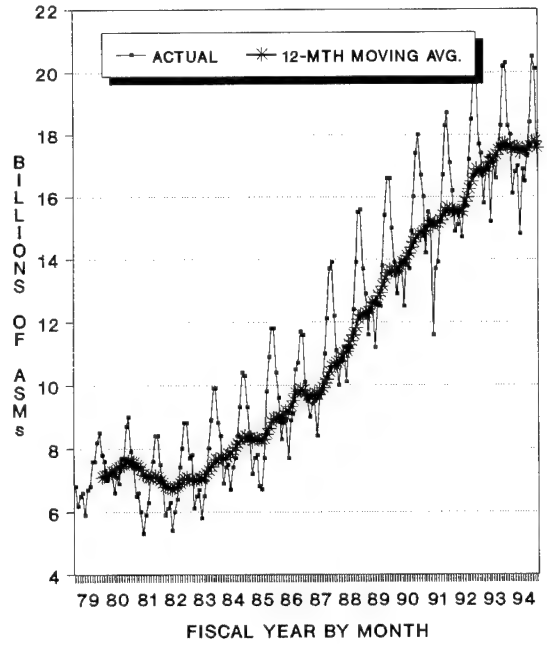


PASSENGER ENPLANEMENTS

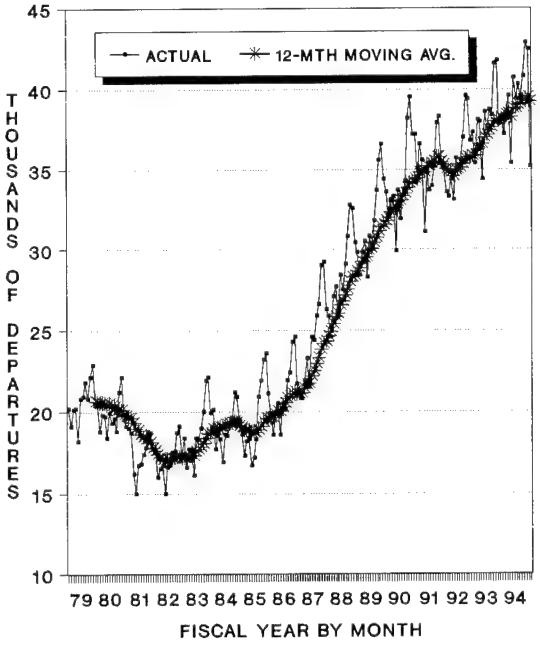


U.S. AIR CARRIER INTERNATIONAL TRAFFIC TRENDS

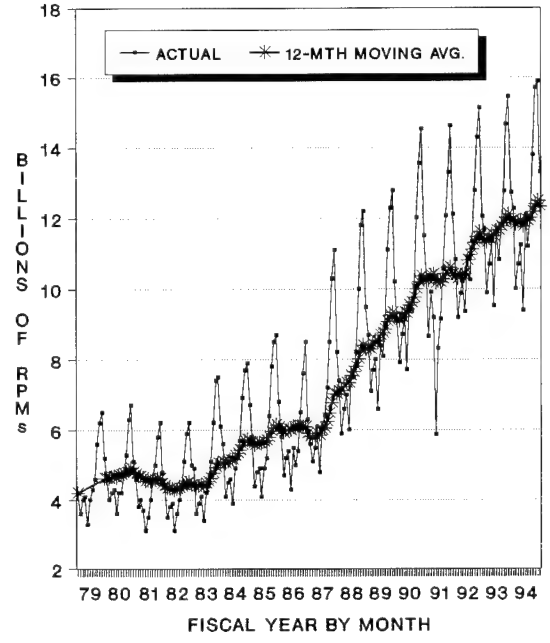
AVAILABLE SEAT MILES



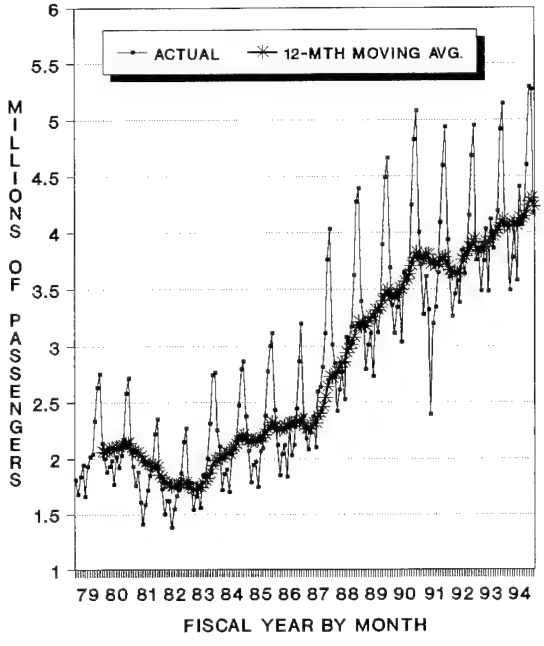
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



International Passenger Traffic and Capacity

International traffic increased slowly in fiscal year 1994, with RPMs increasing 2.8 percent, and enplanements up 2.4 percent. Growth in traffic along with declining ASMs of 1.1 percent, pushed the load factor up to 70.2 percent--an increase of 2.6 points. Although ASMs were down from November 1993 through September 1994, departures increased every month of fiscal year 1994. This is due to two factors: the relative increase in shorter trips, and the use of smaller aircraft.

The international load factor of 70.2 percent is the highest load factor ever achieved in the international sector. The load factor is 1.0 point higher than the record achieved in 1990.

Following declines in RPMs and enplanements in January 1993 and February 1994, traffic showed a steady increase from March through September. From November 1993 through September 1994, the commercial air carriers continued to reduce capacity.

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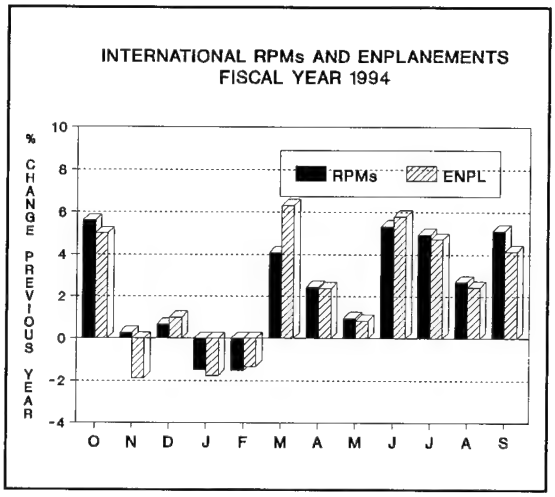
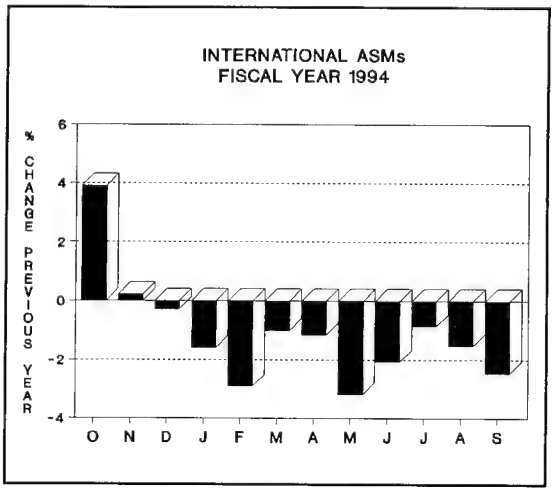
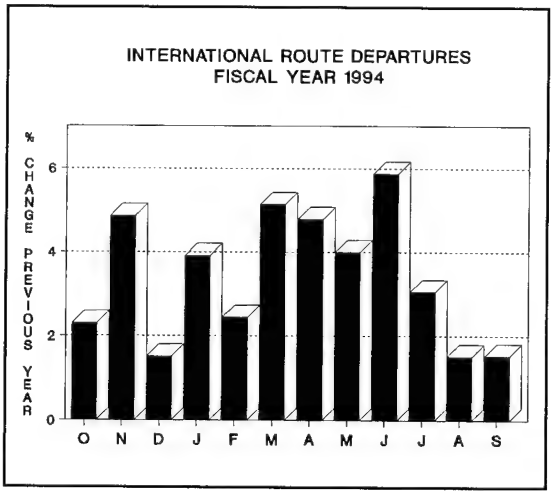


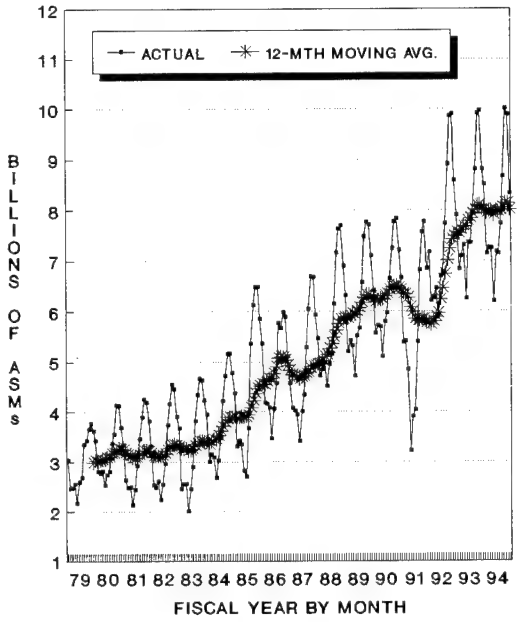




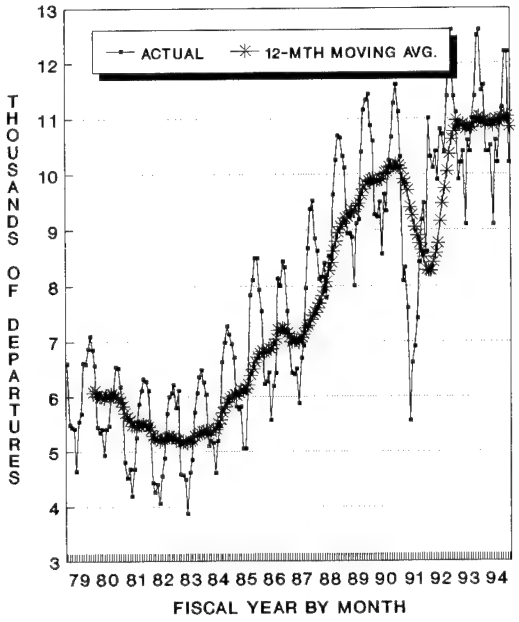
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - ATLANTIC ROUTES

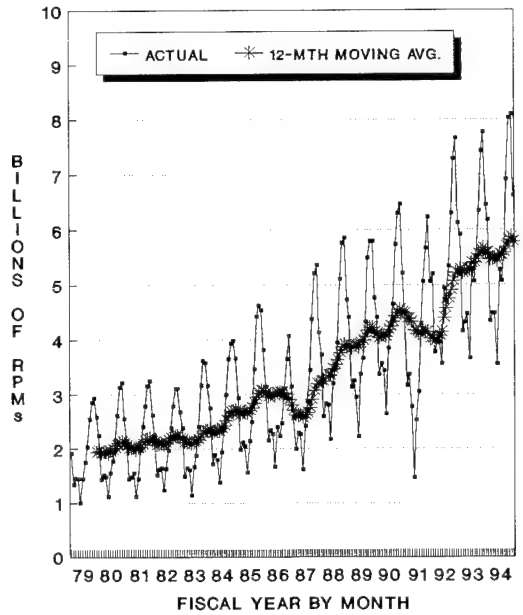
AVAILABLE SEAT MILES



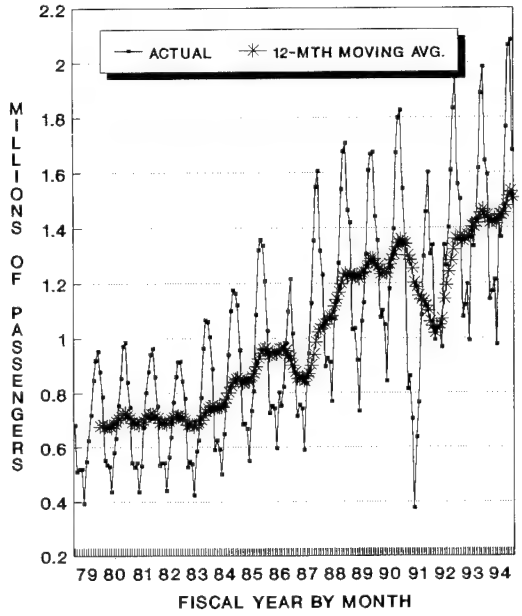
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Atlantic Routes

Transatlantic traffic demand was up in 1994. RPMs increased 4.2 percent and enplanements increased 4.9 percent. During this period ASMs decreased 0.2 percent. RPMs showed a steady increase from March 1994 through September, while ASMs continued to decline over the same period. Growth in traffic in the Atlantic markets was stimulated by an expanding European economy and a continued decline in fares. Current dollar and real yields in the Atlantic market decreased 1.4 and 3.8 percent, respectively, in 1994.

The number of passengers enplaned on the Atlantic routes in fiscal year 1994 totaled 16.5 million, an increase from 1993's 15.7 million. The level reached in fiscal year 1994 is higher than the previous peak of 16.1 million in 1990 (which included Pan American's intra-Germany traffic).

The average number of seats per aircraft showed a small increase in fiscal year 1994. The number of seats increased from 230.2 in 1993 to 231.0 in 1994. Departures decreased from February 1994 through September, with the largest declines in July, August, and September of the fiscal year. Load factor in 1994 was 72.3 percent, up 2.9 points from 69.4 percent in 1993.

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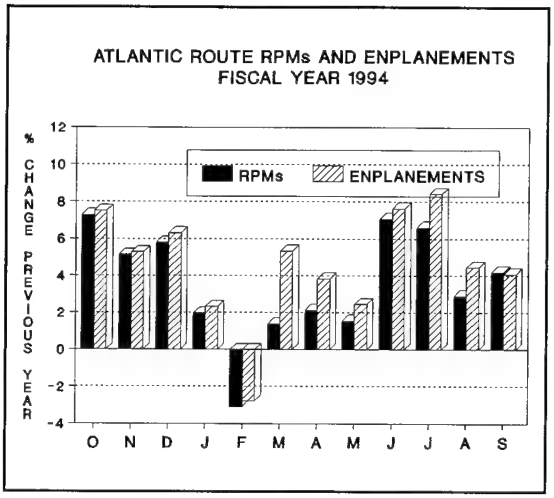
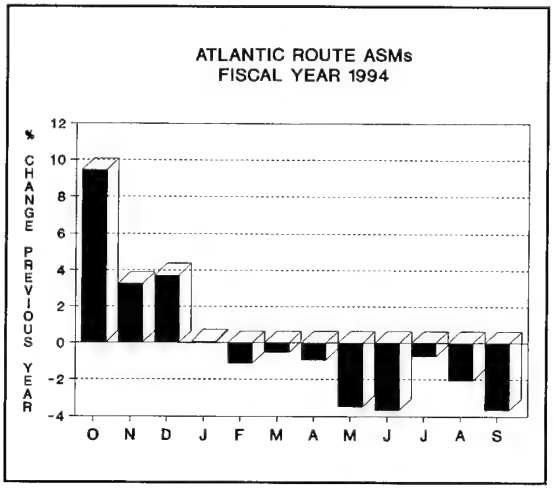
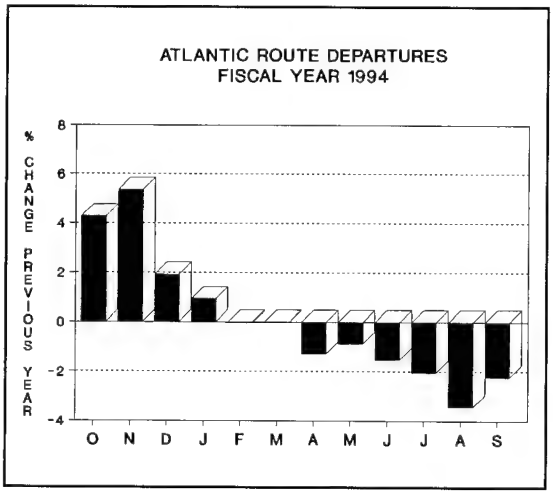


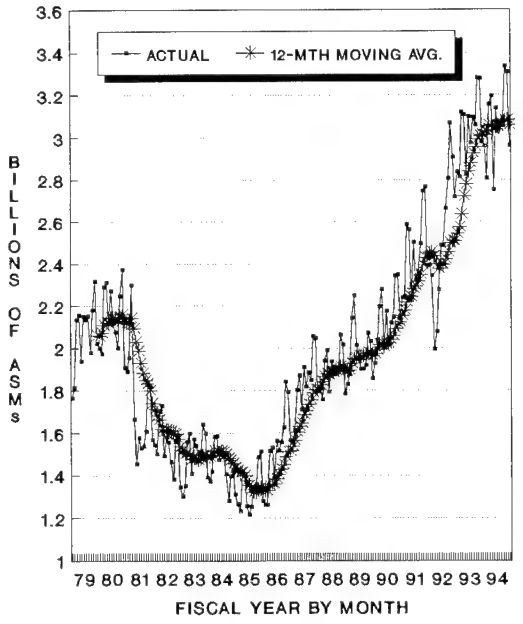




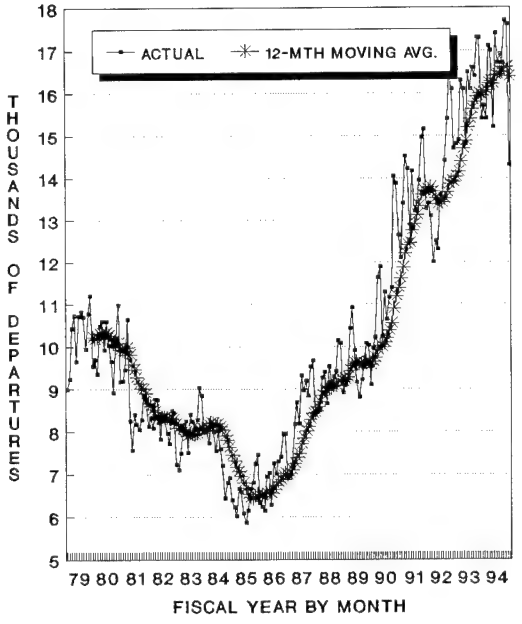
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - LATIN AMERICAN ROUTES

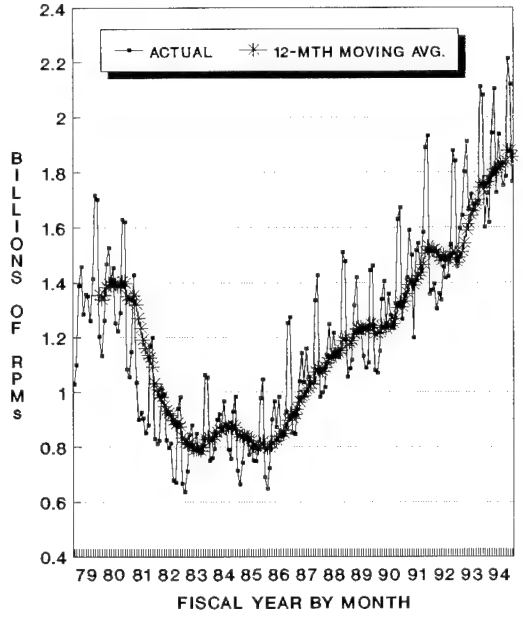
AVAILABLE SEAT MILES



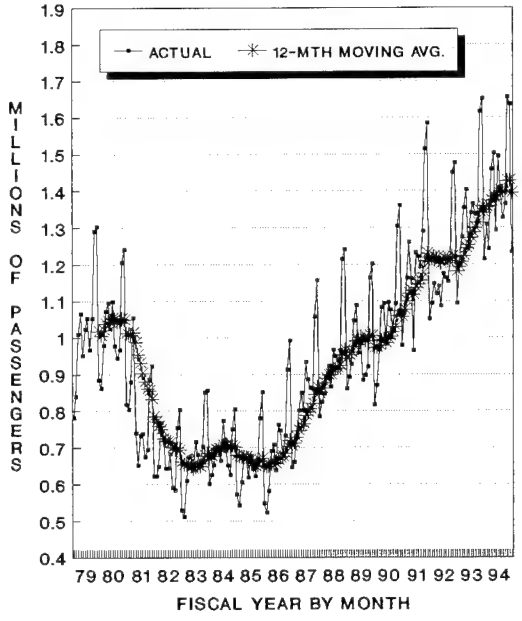
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Latin American Routes

Traffic demand to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) continued to expand in 1994, however at a much slower pace than that experienced in 1993. RPMs were up 6.0 percent, capacity increased only 0.7 percent, and the load factor increased 3.0 points to 60.9 percent. Passenger enplanements were 16.4 million, up 3.7 percent over 1993.

Expansion in traffic resulted from service and traffic improvements, and continued strong economic growth in the United States and Latin America. Yield was stable in the Latin American market in 1994, with real yield showing no change from 1993.

Monthly changes in capacity and traffic illustrate the slowing in the growth of capacity relative to the growth in RPMs and enplanements. Following a surge in capacity in 1993--up 22.2 percent over 1992--ASMs have either declined or shown a moderate increase each month through fiscal year 1994. During this same period, except for November 1993, RPMs have continued to expand at a relatively strong pace.

According to data filed by operating entity, the U.S. passenger carriers serving the market had an operating profit of $325 million in fiscal year 1994, making the Latin market the most profitable of the international entities.

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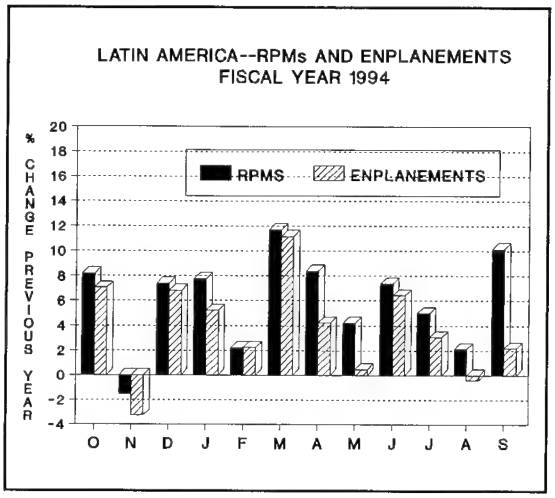
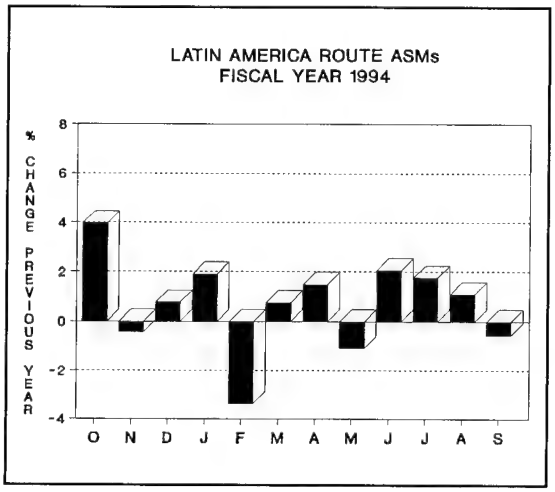
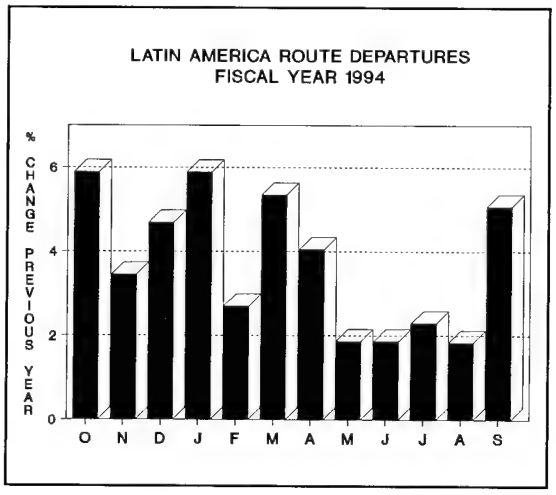


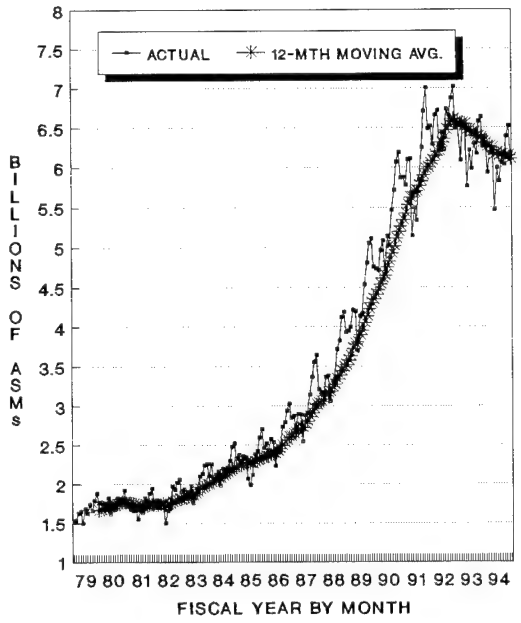




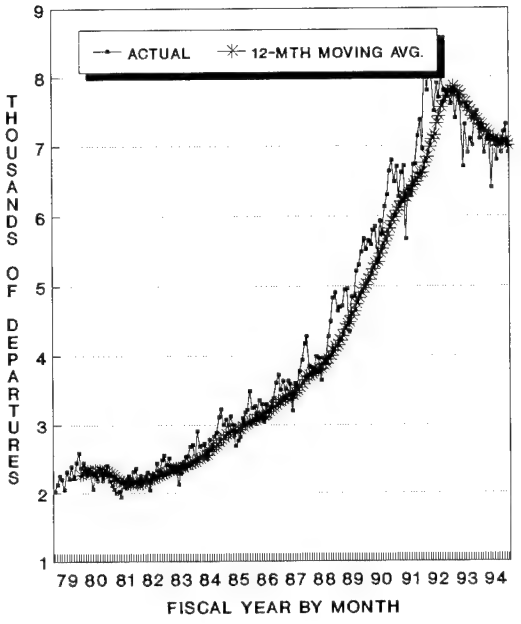
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - PACIFIC ROUTES

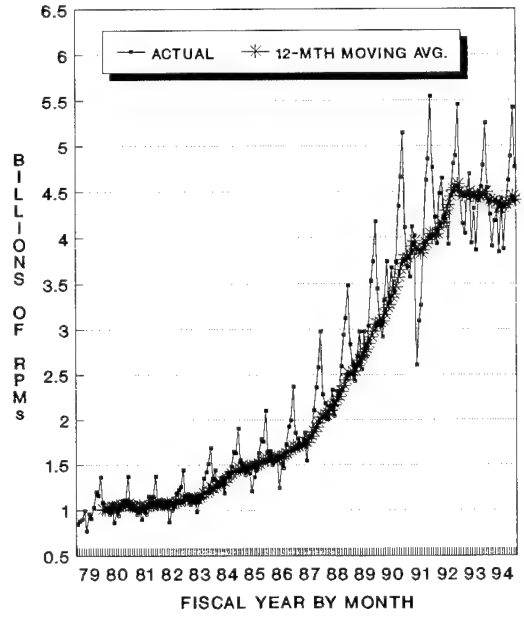
AVAILABLE SEAT MILES



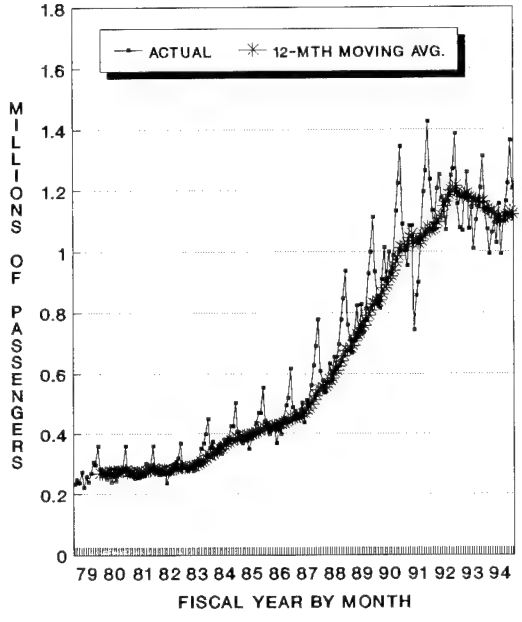
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Pacific Routes

Passenger traffic to Pacific destinations declined again in fiscal year 1994, but at a slower rate than that experienced in 1993--2.2 percent. The decrease in 1993 was the first since 1982. During the period from 1982 to 1992, RPMs and passenger enplanements more than quadrupled, each increasing at an average annual rate of 14 percent. The reduction in 1994 provides an indication of the continued sluggishness of the Japanese economy.

In 1994 RPMs dropped 0.2 percent and enplanements declined 1.9 percent. Capacity on the trans-pacific routes decreased 3.0 percent, and the load factor increased 2.0 points to 72.1 percent. The market is costly to serve, in terms of operating cost, and high load factors are required.

The high load factor created increased profits for the Pacific market over fiscal year 1993. According to data filed by operating entity, the U.S. passenger carriers serving the market made $315 million operating profit in fiscal year 1994. In fiscal year 1993, the operating profit was only $38 million.

Real yield decreased 7.4 percent in 1994, while current dollar yield decreased 5.1 percent. Yields do not necessarily reflect the net to airlines in this market, as the expenses (commissions) can represent a very high percentage in international markets, especially in the Pacific area.

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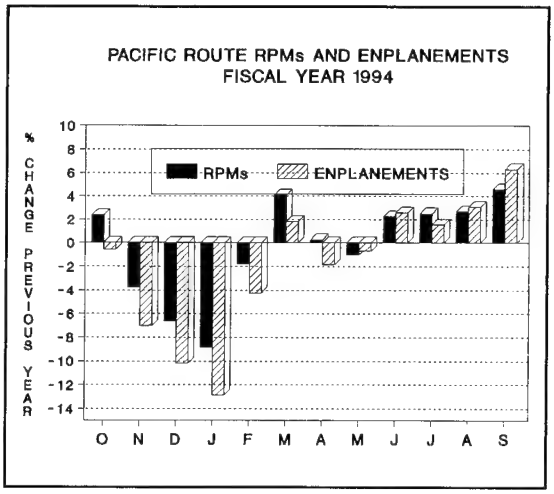
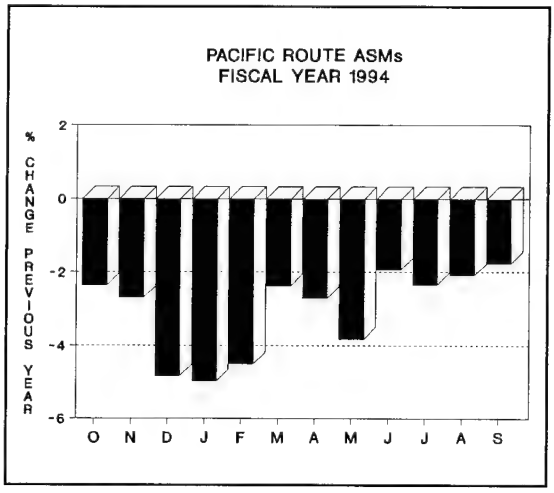
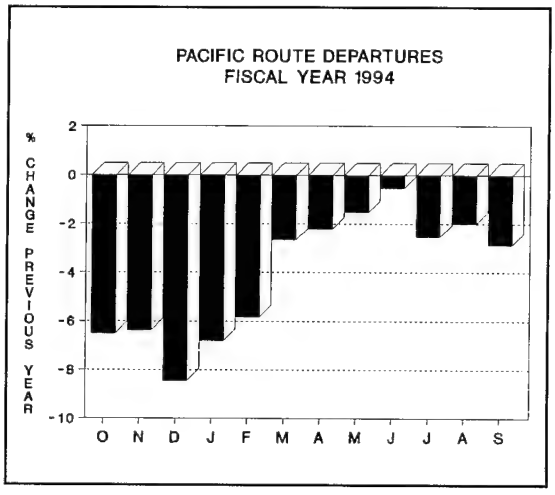






NONSCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers increased 0.7 percent in fiscal year 1994, to a total of 11.3 million. Domestic enplanements declined 8.2 percent, while international enplanements increased 17.6 percent.

Nonscheduled revenue passenger miles were up 7.5 percent, and available seat miles increased 8.6 percent. The nonscheduled load factor decreased from 74.3 percent to 73.5 percent, down 0.8 points. Historical (1984-1994) nonscheduled traffic, capacity, and load factor statistics are in Appendix C.

AIR CARGO TRAFFIC

Air cargo revenue ton miles (RTMs) flown by U.S. air carriers reporting on RSPA Form 41 totaled 20.8 billion in fiscal year 1994, up 13.0 percent from 1993. Freight/express RTMs increased 13.3 percent, while mail RTMs increased 8.0 percent.

Domestic cargo RTMs were up 9.1 percent, while international RTMs increased 17.2 percent. Historical (1984-1994) domestic and international air cargo statistics may be found in Appendix D.

FORECAST ASSUMPTIONS

The background against which the present forecast is developed involves three major factors--changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. The baseline forecasts of commercial air carrier traffic and activity during the next 12-year period (1995 to 2006) are made against an uncertain background, particularly with respect to the industry structure and changes in the market.

ECONOMY

The economy is expected to continue to expand at a moderate rate. Chapter II discusses the economic assumptions in detail. An important assumption is that economic growth, while not robust, will provide a stable base for air travel in both the business and leisure travel markets.

The general economy has recovered from recession, and the unemployment rate is declining. While restructuring and "downsizing" type layoffs in a number of companies will continue in the near future, total employment is increasing. Also, there does not seem to be the widespread fear of layoff among white collar workers that seemed to affect consumer behavior during the worst of the 1991-1992 recession. In addition, corporate travel budgets have apparently recovered, along with an improved business profit outlook.

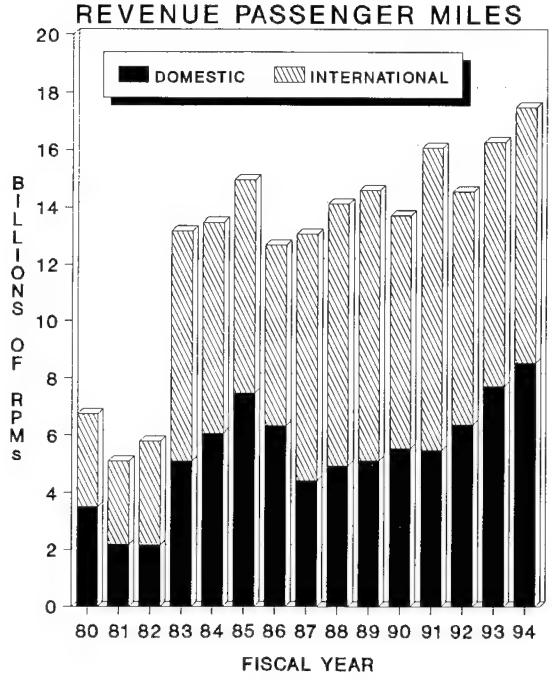
One major concern for the future involves pressures on disposable income that might impede the growth of air travel. In particular, unknowns include the potential cost of health care in the future, as well as the impact of tax rate changes.

Internationally, the economic outlook is positive for Japan, Europe, and Latin America. Growth rates for economic activity and air travel should continue to improve.

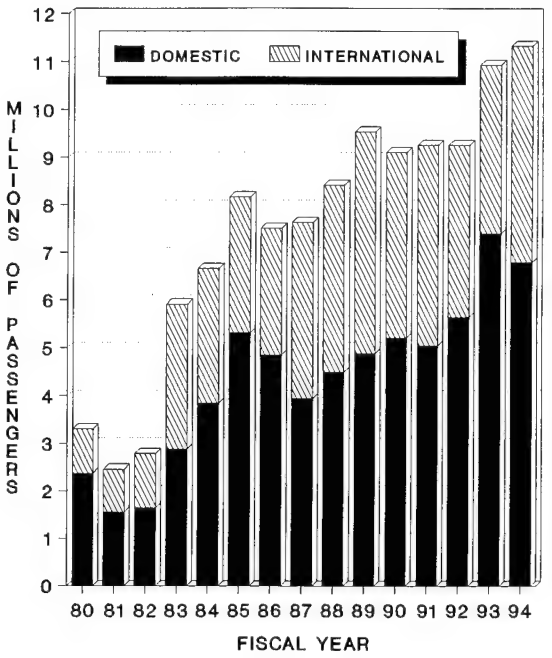
Consumer confidence continues to improve, which should be a boost for

U.S. AIR CARRIER NONSCHEDULED TRAFFIC

REVENUE PASSENGER MILES

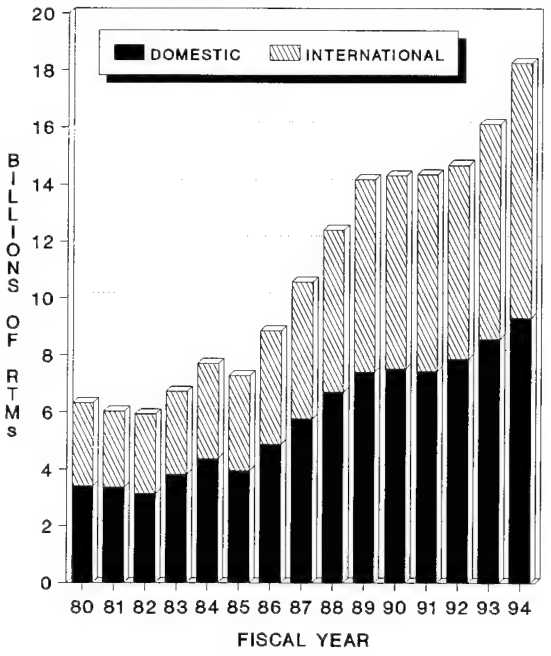


PASSENGER ENPLANEMENTS

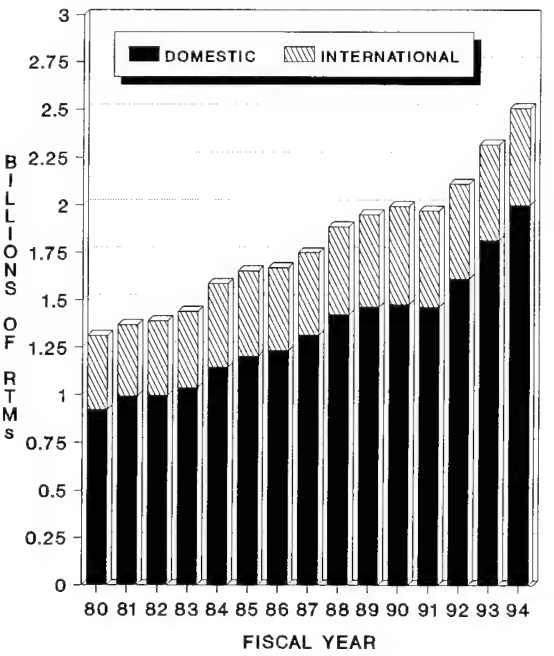


U.S. AIR CARRIER AIR CARGO TON MILES

FREIGHT/EXPRESS TON MILES



MAIL TON MILES



leisure travel. The latest poll by the Conference Board for November 1994, produced an overall level of 101.3, the highest since July 1990, up sharply from October's 89.1.

In summary, continued economic expansion in the United States, Europe, Asia, and Latin America is expected to have a strong positive influence on aviation activity over the next several years.

INDUSTRY STRUCTURE

Two related elements of the industry structure are creating pressures toward lowering costs in the domestic airline industry. First, a wave of entry is under way, fueled in part by the availability of inexpensive aircraft, and partly by the financial success of Southwest Airlines and other new entrants. Some predictions indicate that by 1996, new-entrant carriers--excluding the new low-cost operations of established airlines--could peak at about 6.5 percent of industry market share in 1996.

New entrants ensure that competitive forces remain strong, and new entrants will remain a factor in the industry. The availability of aircraft at favorable lease rates and the potential for profitable operations stimulate new entry.

Second, many relatively high cost carriers are restructuring in an attempt to achieve unit costs of 7.5 cents per ASM--the level achieved by Southwest. Essentially, airlines are looking to their labor forces for work rule changes and wage concessions to increase productivity and lower costs. For example, in April, Delta announced its Leadership 7.5 cost-cutting and restructuring program. The goal of the program is to eliminate $2 billion from Delta's yearly costs by 1997. Also, United started a new low-cost, short-haul service on the West Coast in an attempt to reduce unit costs. The forecast assumes only limited additional industry concentration. It is probable that there will be some added consolidation of air carriers. In 1994 Southwest Airlines merged with Morris Air. While no "trend" is set by a few mergers, it is safe to say more mergers may occur among compatible new entrants, and new viable carriers will emerge from the large number of new entrants. Present low-cost carriers, such as Southwest, will continue to exert an important competitive force in the market.

The development of modified services provided by existing carriers--USAir's low-cost service, Continental's CALite, and United's new low-cost, short-haul service on the West Coast has created an additional dynamic force in the industry. If these relatively new operations are successful, additional carriers may attempt to lower their costs and increase their product differentiation by entering this market.

The present forecast does not develop high/low scenarios, but presents a most likely scenario. The near-term forecast could be understated if new entry formation and operations increase at a high rate. This is particularly difficult to project, since venture capital can expand (and contract) very rapidly.

Another factor that might influence developments among the major carriers is the spreading employee ownership of majority interests in major carriers. In particular, in 1994, United Airlines employees acquired ownership of a majority of the parent firm, UAL Inc. While the immediate impacts of this change in ownership are not clear, there are changes in incentive and employee outlook implied by this type of arrangement. The ramifications are positive for the basic goal of lowering the cost structure of the larger major carriers.

Wide extension of employee ownership programs could have a major impact on the operations and cost structure of the industry.

The current system of bilateral agreements, which started back in the 1940s, severely restricts competition in international markets. It is well know that heightened competition can improve efficiency, productivity, and worldwide economic growth. At the present time, the United States is attempting to create a more competitive international aviation environment for the U.S. airlines through the development of mutli-national agreements.

In general, the agreements would contain provisions for liberalizing and changing passenger and cargo service; international, capital flows and ownership; market access and government subsidies. if these agreements can be reached during the next several years and a more open system is achieved, the more efficient U.S. carriers could experience significantly higher growth than we have projected.

The industry is expected to continue toward globalization, although there seems to have been a cooling of the industry enthusiasm for large capital commitments on the part of carriers interested in major international alliances. The British Airways/USAir arrangement, approved in early 1993, is being watched closely, but has not started a new round of such agreements. Other existing major network alliances include the associations between Northwest and KLM, Continental and Air Canada, and United and Lufthansa.

While stronger international alliances are high on the list of industry needs, the immediate major priorities of the industry appear to involve labor issues, ownership, and cost control.

In summary, the industry is dynamic, with new entrants, new low-cost options on the part of existing carriers, and the possibly of a number of mergers and international agreements. All of these forces could increase efficiency and stimulate travel.

MARKET CHANGES

Perhaps the major reason for the dynamic state of the industry is that attempts to achieve profitability through major pricing initiatives alone have failed. Since market forces are setting prices, the only approach available for maintaining profit margins is to lower unit costs and increase productivity. Another important factor appears to be the increasing sensitivity of travelers (both business and leisure) to the cost of the air trip. Thus, costs and fares must be kept low to attract more travelers, especially leisure travelers.

The air travel market is broadly divided into two sectors--business and leisure. There has been an historically declining percentage of air travel classified as "business." In recent years we believe that the decline in the percentage is associated with improvements in other communication technologies, such as fax, computer interfaces, and teleconferencing.

If the historical trends continue, the market for air travel will rely more heavily on non-business demand as the communications revolution continues to change the way business is conducted. The future development of video/computer conferencing is another force on the horizon that will change business travel patterns.

The much heralded "information highway" will allow a video and data link between two or more individuals or groups so that video images, voice, and data can be exchanged in real time. This capability may gradually further

erode business travel. While it will always be necessary to conduct "in person" meetings, innovative new technologies such as video conferencing will likely substitute for many of today's business trips.

In summary, leisure travel, which is highly price sensitive, will be more important in the future. And as businesses demand more efficiency, they can be expected to be more price sensitive. It seems an inescapable conclusion that cost efficiencies must be achieved to keep fares low and create stable financial returns for the industry. This is the fundamental presumption of the forecasts that follow.

MODEL APPROACH USED

The model used in developing FAA forecasts relies upon a system of deterministic and statistical equations. One of the pivotal equations relates RPMs to two primary independent variables, GDP and yield. GDP change is discussed in Chapter II, and yield is discussed below. In developing the forecasts each year, we test a number of alternative approaches. This year two alternatives were evaluated. One dealt with using two-stage least-squares to estimate the parameters of the model, and the second with using other measures of income in the RPM equation.

It should be noted, that from a theoretical perspective, it might be preferable to use two different models to estimate business and personal travel. They are two distinct markets which are affected by different variables. Total RPMs would simply be estimated by summing the independent estimates of the two segments. At this time, however, this approach is not possible because of a lack of data. Additional research and data collection is required to develop a sound time series for these two different markets.

During the pre-deregulation era, prices were determined by the Civil Aeronautics Board, and generally did not respond to shifts in demand and/or supply. Market forces quickly took hold following deregulation in 1978. To adjust for the jointly dependent variables in demand and supply equations, two-stage least-squares was used to estimate the RPM model (demand equation) for the period 1979 through 1994. The primary exogenous variable used to estimate real yield was real operating costs per available seat mile. Since the results were theoretically and empirically sound, they were used to develop this year's forecasts.

The other measures of income and/or economic activity tested in the RPM model were personal income per capita and median family income. These variables along with population and yield were used to estimate the parameters of the RPM equation. The results from both equations using these variables were consistent with the use of GDP as the measure of economic activity. In addition, the forecasts of aviation activity using the two different formulations produced forecasts that were not significantly different from those constructed using GDP and yield.

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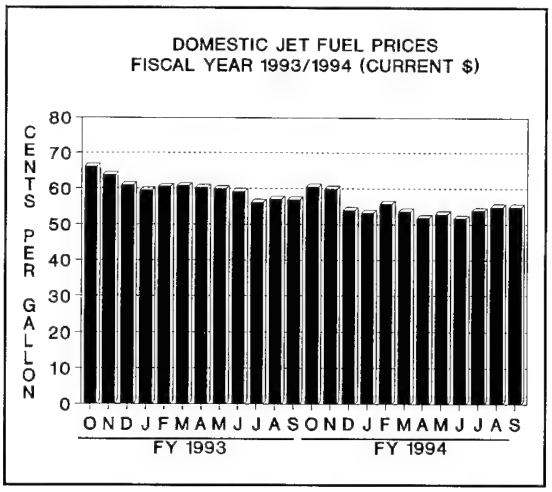
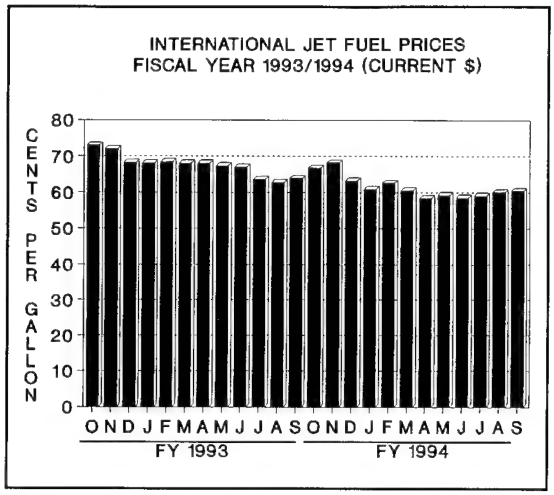
OTHER VARIABLES AND ASSUMPTIONS

In addition to the industry and economic variables discussed above, FAA's forecast approach involves specific review of independent variables that influence the forecast. The principal variables are the cost of jet fuel for air carriers and the yields which we expect air carriers to obtain.

JET FUEL PRICES

During fiscal year 1994, jet fuel prices generally declined, as stability returned to the jet fuel market. Fuel costs averaged 56.5 cents a gallon in fiscal year 1994, with the average 54.7 cents for the domestic purchases and 61.5 cents for international. The system price was 9.0 percent lower than the average paid in 1993.





Changes in jet fuel prices can have a major impact on air carrier financial performance. Barring any unforeseen fuel supply disruptions or major new oil discoveries, jet fuel costs are expected to decline gradually in real terms during the 12-year forecast period.

System jet fuel constant dollar costs are expected to decline 4.7 percent in 1995, then to remain relatively stable, decreasing only 2 percent during the ten year period 1996 to 2006. Jet fuel price stability will be an aid to the industry in achieving financial stability in the future. However, the industry's exemption from the 4.3 cents per gallon fuel tax expires on October 1, 1995. If the exemption is removed, domestic fuel prices would increase by about 8 percent. The forecast of fuel prices is shown in Chapter IX, Tables 6 through 8.

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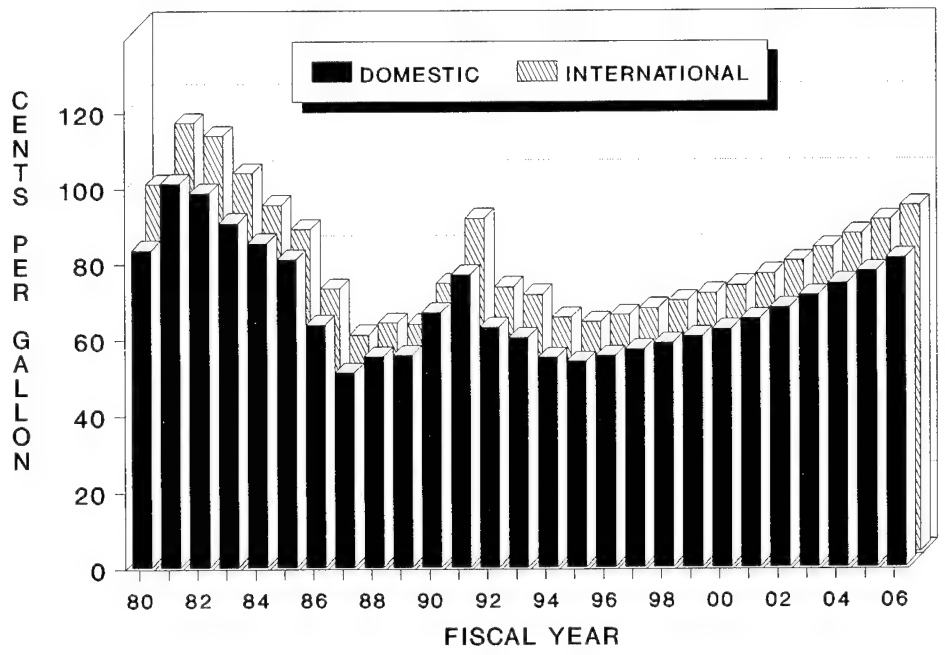
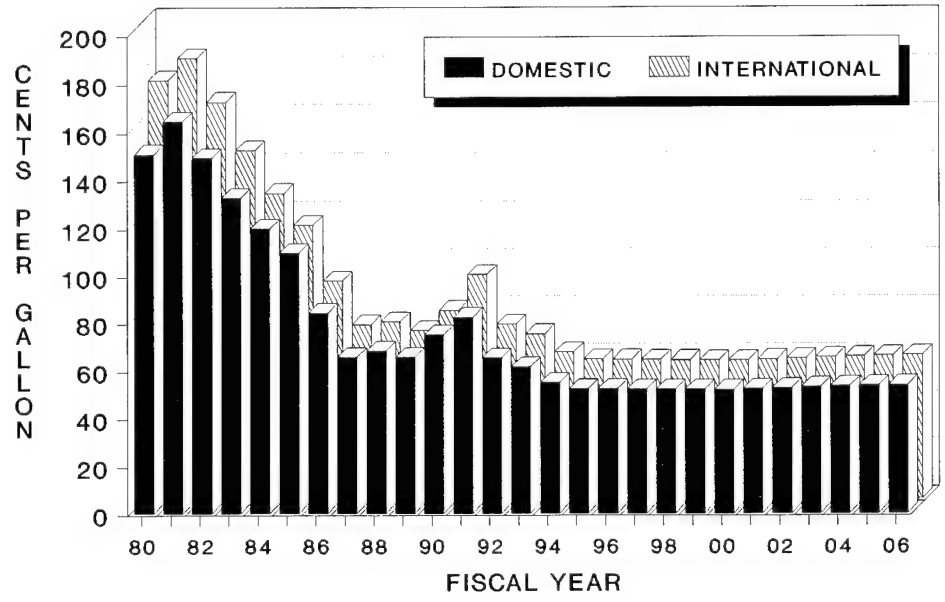
JET FUEL PRICES - CURRENT DOLLARS



JET FUEL PRICES
CONSTANT (FY-1994) DOLLARS



PASSENGER YIELDS

There has been a long-term downward trend in airline passenger yields during the modern history of transportation. In terms of real yield (discounting fares for inflation), fares in the years 1969 to 1971 averaged 21.4 cents per passenger mile (1994 dollars). There has been a steady decrease in real yield over the years, with the causes of the decrease changing, but always with the result that fares have moved downward. By 1994 the average yield had fallen to 12.73 cents per mile.

In the 1970s the dominant reason for the decrease was the introduction of large numbers of more efficient jet aircraft into the fleets operated by air carriers. In the 1980s the continued decrease was fueled by the deflationary impact deregulation had on the industry. Not only were airlines able to rationalize their route structures, but some labor costs decreased.

In the 1990s, financial weakness in the industry, coupled with high levels of capacity relative to demand, and the growth of new-entrant low-cost carriers has brought about intense fare competition. The highly competitive markets are pushing relatively high cost carriers to restructure and increase productivity. We expect this trend to continue for the next several years.

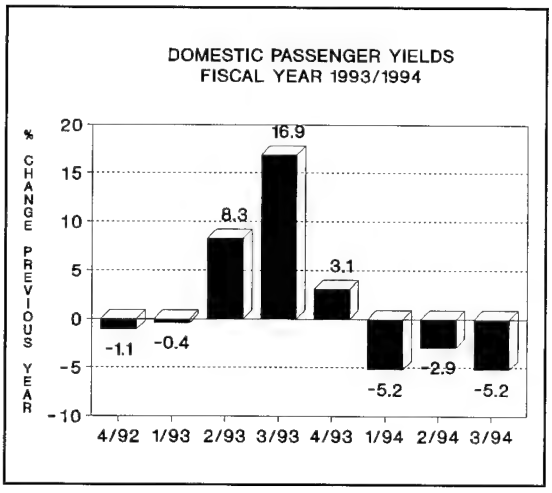
Lower airline cost structures and competition from new-entrant carriers should continue to have a significant depressing effect on real yields through 1997. For the remainder of the forecast period we expect real yields to continue to decline, but at a slower pace. Domestic yields are expected to fall at a much faster pace than international yields.

On a system basis, real yield is expected to decrease 2.4 percent in 1995, 2.7 percent in 1996, and 2.5 percent in 1997. For the entire forecast period (1994 to 2006) real yield is expected to decline at about 1.6 percent a year.

Domestic Passenger Yields

The yield change in 1993, comparing industry quarterly changes in current dollar yield, shows the important effect of the fare wars during the peak third quarter of 1992. Yield was down 11.5 percent during the third quarter of 1992, compared to the previous year. Then in 1993, yield in the third quarter was up approximately 17 percent.

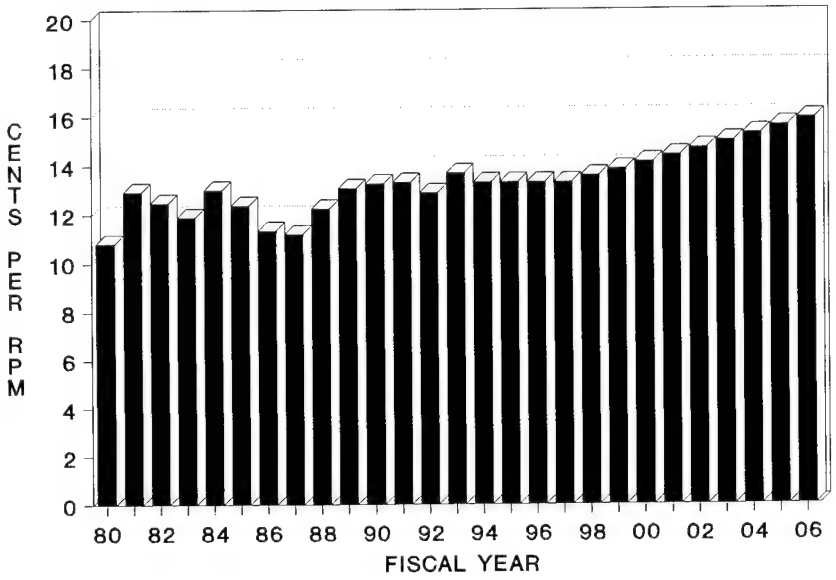
The yield pattern during fiscal year 1994 shows a more "normal trend" that we have been experiencing--a continuing decline in yields due to new-entrant carriers in short-haul markets with relatively low-cost structures. We expect this trend to continue through 1997.



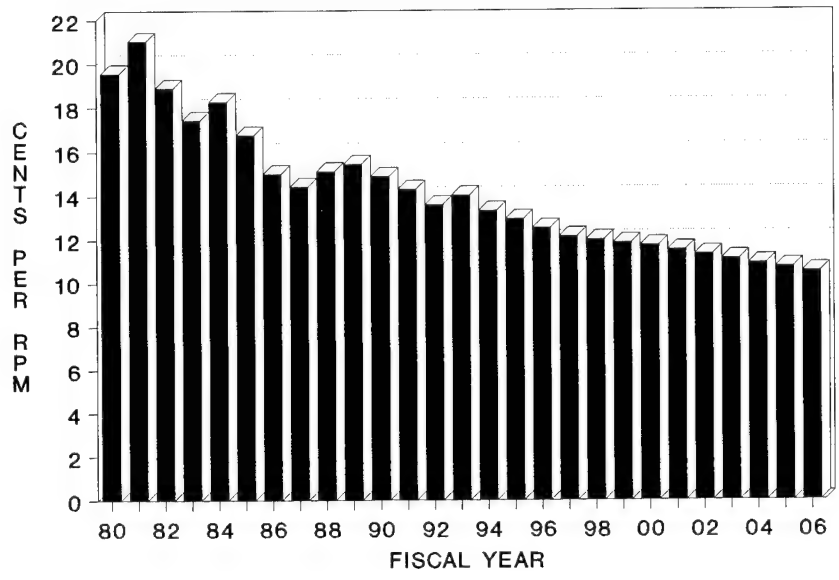
Domestic real yield decreased approximately 3.1 percent per year from 1984 to 1994, and approximately

U.S COMMERCIAL AIR CARRIERS
DOMESTIC PASSENGER YIELD

CURRENT DOLLARS



CONSTANT (FY-1994) DOLLARS

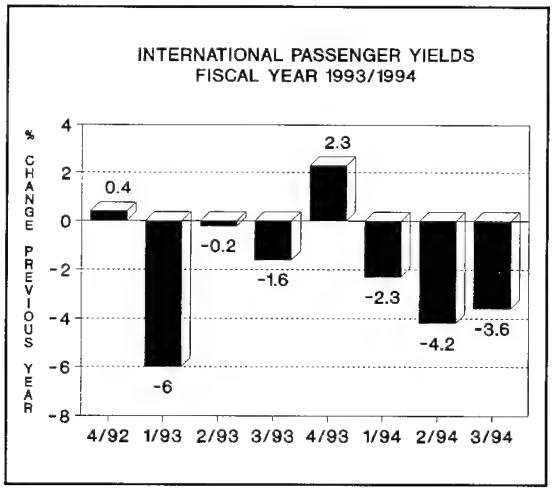


1.5 percent per year in the decade before that. In the period of this forecast, we project a 1.9 percent decrease annually in real yield. Current dollar or nominal yields will increase at an average of 1.5 percent per year during the forecast period.

International Passenger Yields

The setting of international fare levels differs from the domestic process in that many international fares must meet International Air Transport Association (IATA) guidelines and/or be approved by foreign governments.

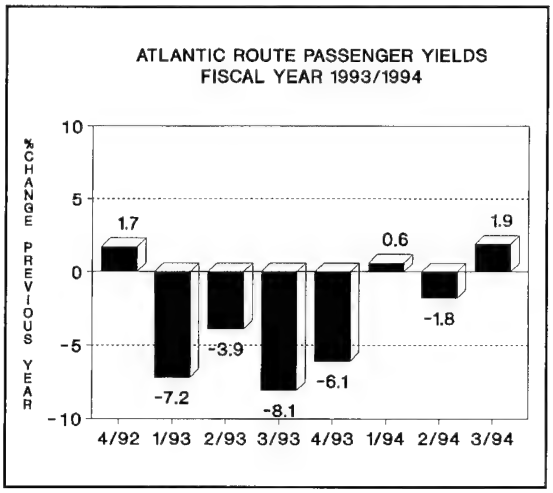
There has been a long-term decrease in international real yield similar to that in the domestic industry (and for similar reasons). Real international yield decreased an average of 1.8 percent per year from 1984 to 1994 and an average of 2.3 percent per year in the decade before that. Real yields in the international market are generally lower than in the domestic market, primarily because operating costs tend to be lower in these markets. These lower costs are associated with the longer average stage length internationally and with the use of larger aircraft, which tend to have lower seat mile costs.



We assume that the international markets have additional efficiencies to allow continued decreases in real yield in the future. The total international real yield is expected to decrease 1.1 percent in 1995, then to decrease about 0.5 percent per year through the forecast period. Current dollar yield is expected to increase 2.9 percent yearly.

Atlantic Routes

In 1994, the major U.S. carriers on the transatlantic routes were American, Delta, and United. Current dollar yield declined 1.4 percent, while real yield in the market decreased 3.8 percent for the year, following a drop of 7.8 percent in 1993.



Real yield in the Atlantic segment of the international market is expected to decrease in 1995 by 1.5 percent. For the remainder of the forecast period, real yield is expected to decline at an average yearly rate of 0.7 percent.

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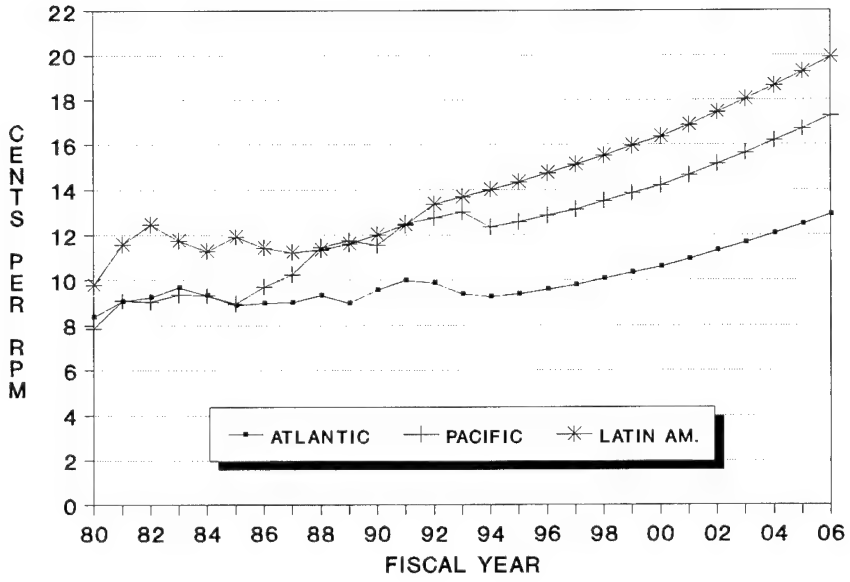
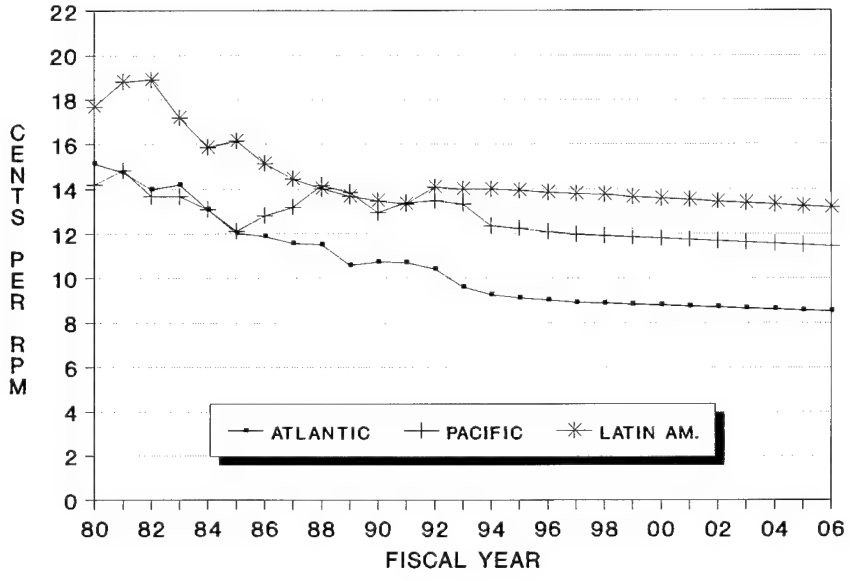
U.S COMMERCIAL AIR CARRIERS

INTERNATIONAL PASSENGER YIELD

CURRENT DOLLARS



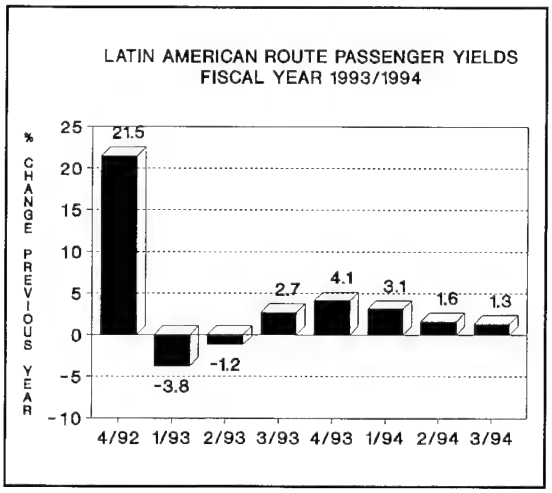
CONSTANT (FY-1994) DOLLARS



Latin American Routes

Latin American current dollar yield increased 2.4 percent, approximately equal to the general increase in prices. Real yield, therefore, showed no change in 1994, following a decline of 0.6 percent in 1993. For the period 1984 through 1994 real yield declined at an annual rate of 1.3 percent.

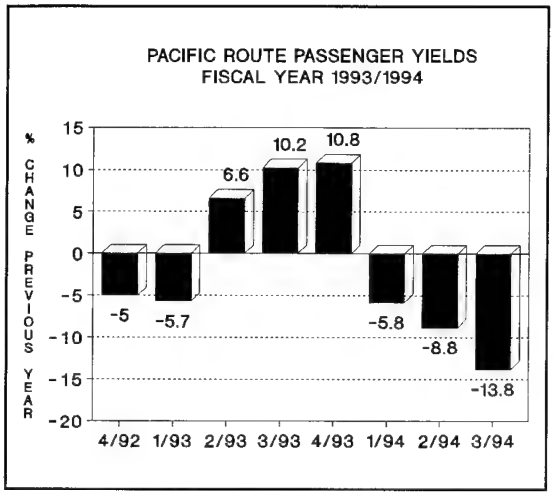
We expect real yield to continue to decline through the forecast period at an annual rate of 0.5 percent.



Pacific Routes

Current dollar yield in the Pacific markets decreased 5.4 percent in 1994, and real yields declined 7.4 percent. The forecast period is expected to show real yield declining at an average annual rate of 0.6 percent. Nominal yield is forecast to increase an average of 2.8 percent per year during the same period.

The individual market yield projections are shown in Chapter IX, Table 9.



PASSENGER TRIP LENGTH

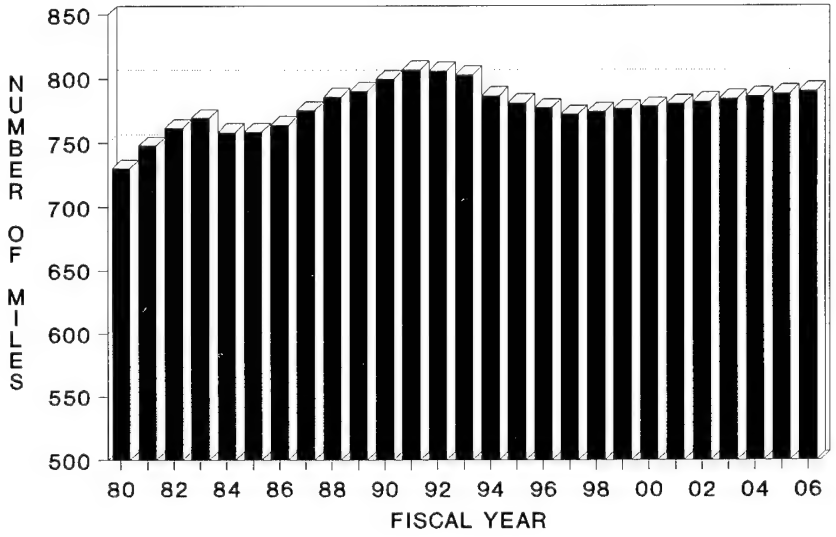
The average system passenger trip length (984 miles) decreased by 24.9 miles in fiscal year 1994, largely the result of a significant drop in the trip lengths in the domestic and Atlantic markets. The domestic passenger trip length over the past several years has continued to decline due to the relatively large growth of short-haul market activity, which has been fueled by new-entrant low-cost carriers. We expect this trend to continue for the next several years.

Average trip length is forecast to continue to decrease through 1997 and then increase at about 6.6 miles per year during the forecast period, continuing the historical upward trend. The trends are shown graphically and in Tables 6 through 8 in Chapter IX.

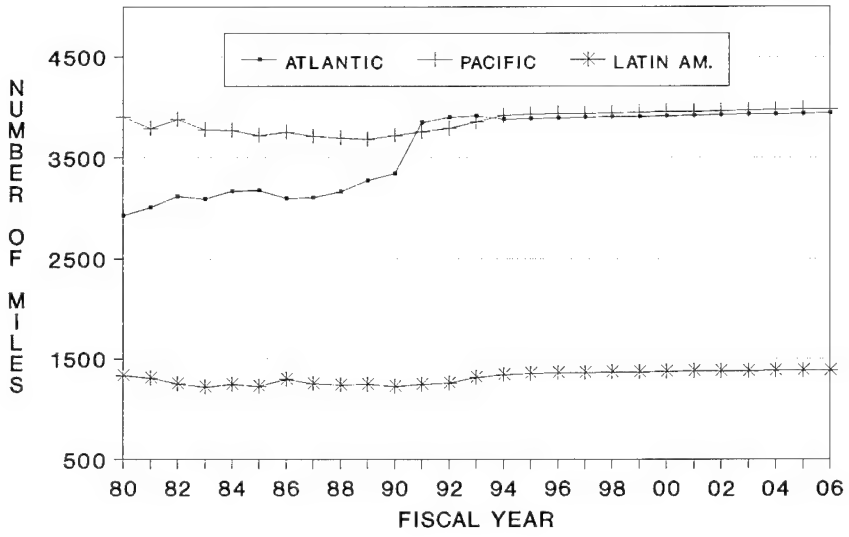
Domestic trip length is expected to decrease from 786.9 miles in 1994 to 772 in 1997. For the period 1997 through 2006, we expect the rapid growth of the short-haul market to stabilize relative to the growth of the long-haul market. Hence, during this period, the domestic trip length is expected to increase by about 2 miles a year. The trip lengths in individual international markets are expected to increase:

U.S COMMERCIAL AIR CARRIERS
PASSENGER TRIP LENGTH

DOMESTIC



INTERNATIONAL



- Atlantic trip length increases from 3,881 miles in 1994 to 3,941 miles in 2006.

- Latin American trip length increases from 1,342 miles in 1994 to 1,386 miles in 2006.

- Pacific trip length increases from 3,918 miles in 1994 to 3,983 miles in 2006.

AVERAGE AIRCRAFT SIZE

Between 1978 and 1983, the average system seating capacity of aircraft used by U.S. commercial air carriers increased by almost 20 seats (from 147.2 to 167.1 seats). Between 1983 and 1992, however, the average seating capacity of the U.S. fleet remained surprisingly stable, standing at 168.3 seats in 1992, up only 1.2 seats from 1983. In 1993 and 1994 average system seating capacity dropped 2.1 and 3.3 seats, respectively--the largest declines observed over the past 20 years. Clearly, the rapid increase in domestic short-haul traffic with carriers utilizing relatively smaller aircraft has been partly responsible for this phenomenon. We expect this trend to continue through 1997.

New legislation will require stage-2 aircraft to be removed from the U.S. fleet by January 1, 2000. This legislation should result in the retirement of significant numbers of the smaller stage-2 fleet throughout the forecast period. This, added to the fact that the aircraft being delivered to the U.S. fleet are generally larger than the ones being replaced (the exception being the Fokker 100), should result in an increase in the average seating capacity of the air carrier fleet for the period 1997 through 2006.

The forecast assumes that the average seating capacity of the U.S. commercial airline fleet will decrease through 1996, and then increase by an average of about two seats per year over the for the remainder of the forecast period. The history and forecast of average seat size is shown graphically and in Tables 6 through 9 of Chapter IX.

PASSENGER LOAD FACTOR

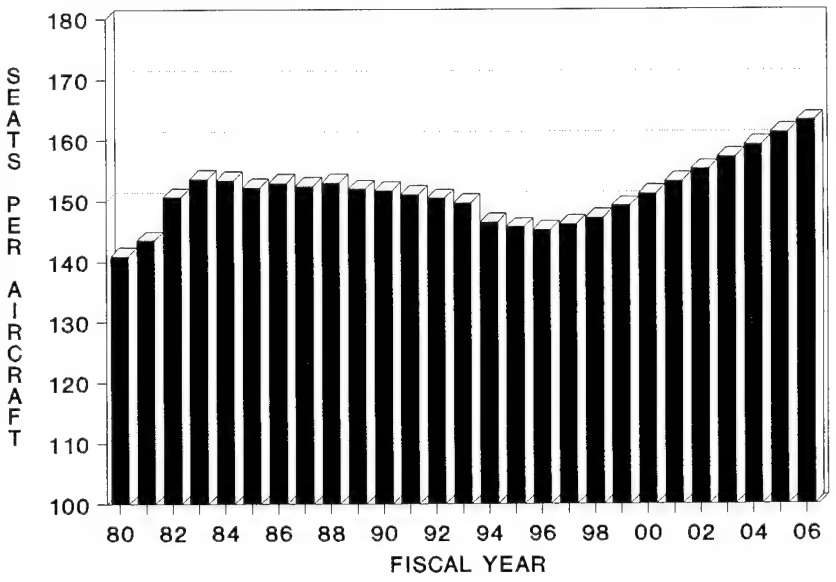
U.S. scheduled air carriers recorded a systemwide load factor of 65.8 percent in fiscal year 1994, up significantly from the previous peak of 63.7 reached in fiscal year 1992. The major unknown that will influence the near-term load factor is the capacity plans of the major carriers. Most carriers have made dramatic changes over the last few years in their equipment plans, particularly with respect to delivery of equipment in during the next several years. Deliveries less retirements define the fleet changes for airlines.

One must consider load factor assumptions in the context of demand and capacity constraints. We expect a 5.3 percent increase in traffic in 1995 and a 5.6 percent increase in 1996. Normally, we assume that available seat miles will be adjusted in response to changes in demand, thereby resulting in a "normal" load factor. However, if capacity does not go up as quickly, as many think, load factor may increase.

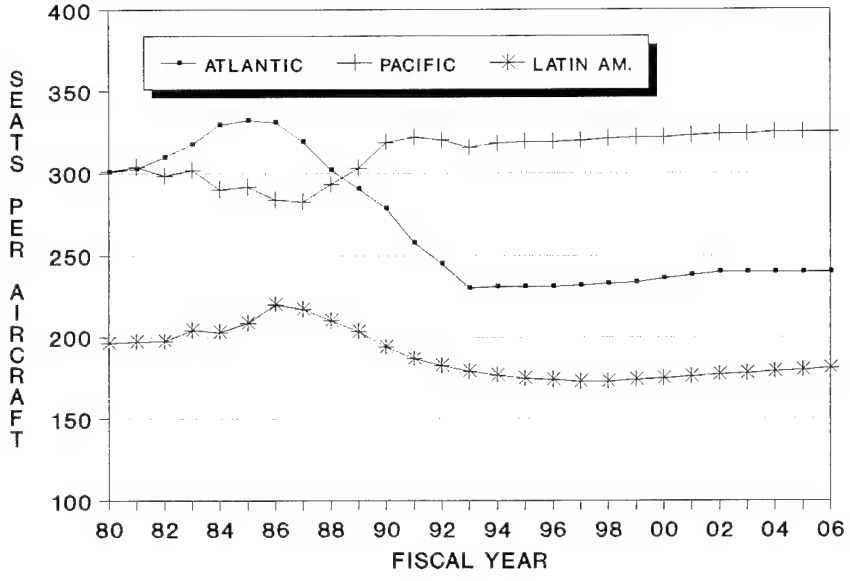
Looking at fiscal year 1995, if capacity increases 4.4 percent from 1994 and RPMs increase 5.3 percent, the resulting load factor will be 66.3 percent. The industry had 63.7 percent (1992) for its previous record high load factor. If capacity grows at a slower rate than traffic, carriers could possibly increase their fares (or greatly limit space for discounted traffic). The result would be fewer RPMs than forecast but greater profits.

U.S COMMERCIAL AIR CARRIERS
SEATS PER AIRCRAFT

DOMESTIC SERVICE



INTERNATIONAL SERVICE



We expect the domestic industry in fiscal year 1995 to push its load factor up to 65.0 by limiting the growth in capacity relative to traffic. This result represents the most likely outcome because present conditions in the market will not allow carriers to increase fares. A fare increase of significance (in real terms) would not hold in the market, because a number of carriers are still competing by offering low prices.

There are two ways to provide additional capacity for the domestic market beyond what is "planned" today. First, aircraft and crew utilization has some slack in it. Second, there are a number of "parked" aircraft, and some carriers may return some of this capacity to the market. We believe that available seat miles will increase in response to increased demand.

Domestic Passenger Load Factor

U.S. scheduled domestic air carriers had a load factor of 64.3 percent in fiscal year 1994, up 3.0 points from 1993. Domestic load factors have varied very little over the period 1985 through 1993, ranging from a low of 60.3 percent in 1986 to 61.3 percent in 1993.

Capacity increased 1.6 percent in 1994, and is expected to increase next year by 4.2 percent. The load factor should increase to 65.0 percent, equal to the highest ever in the domestic market. Beyond 1995 we expect that present fleet plans will provide capacity levels that should keep the load factor relatively high at 65.5 in 1996, and 66.0 percent in 1997 and 1998. For the remainder of the forecast period, we expect load factors to level off at 64.0 percent.

International Passenger Load Factor

The international load factor edged up to 70.2 percent in 1994, up from 67.6 percent in 1993--the highest annual load factor in history. The previous high of 69.2 percent was achieved in 1990.

The same forces that affect domestic capacity (fleet plans and breakeven load factors) affect international capacity. As in domestic markets, U.S. airlines are capable of adjusting their international capacity levels to changing levels of demand. The international load factor is forecast to remain relatively stable during the forecast period, increasing from 70.2 percent in 1994 to 70.3 percent in 2006.

The expectations for the individual market segments are as follows:

- In the Atlantic, the 1994 load factor was 72.3 percent, up 2.9 points over 1993. We expect it to decline slightly and average 72.0 percent for the forecast period.

- In Latin America, load factor increased to 60.9 percent in 1994, up 3.0 points from 1993. We forecast that it will increase gradually over the forecast period to 63.0 percent in 2006.

- In the Pacific, load factor increased to 72.1 percent in 1994, up 2.0 points from 1993. We forecast the load factor to level off at 72.0 percent for the period 1995 through 2006.

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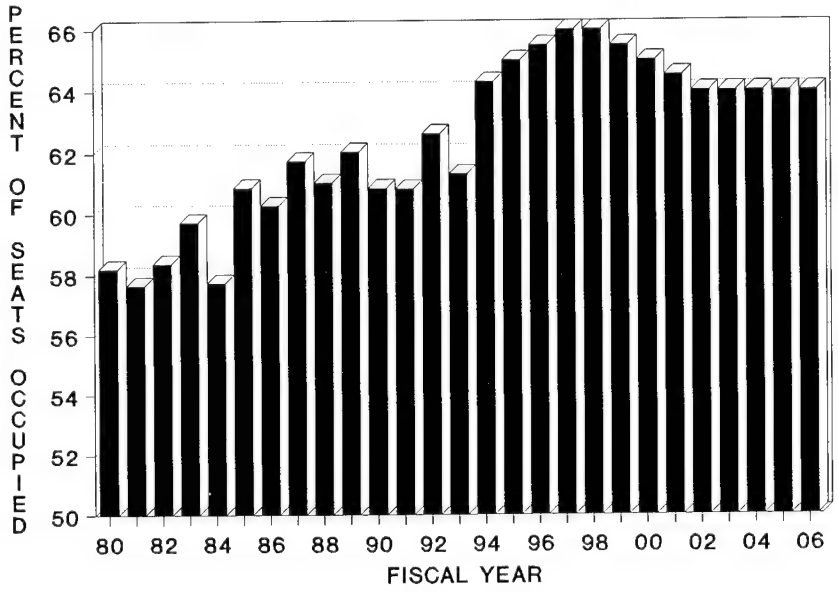
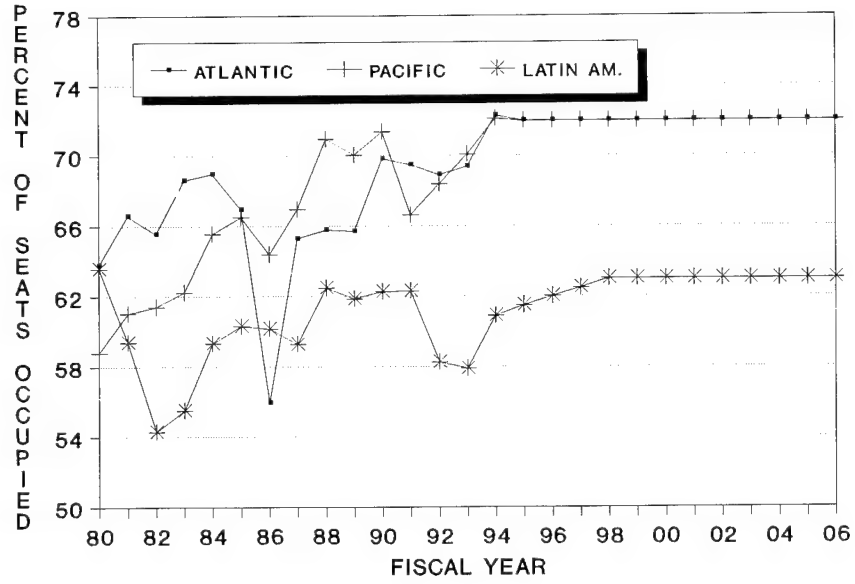
U.S COMMERCIAL AIR CARRIERS
PASSENGER LOAD FACTOR

DOMESTIC



INTERNATIONAL



AIR CARRIER FORECASTS

The forecasts of air carrier demand are based on a specific set of assumptions concerning economic growth in the United States and abroad, the political environment in which they will take place, and changes in industry structure. Clearly, there are many uncertainties in all these areas that could significantly alter the short- and/or long-term environment, and cause the outcomes to be significantly different from those forecast. Some of the developments that could alter the forecasts include:

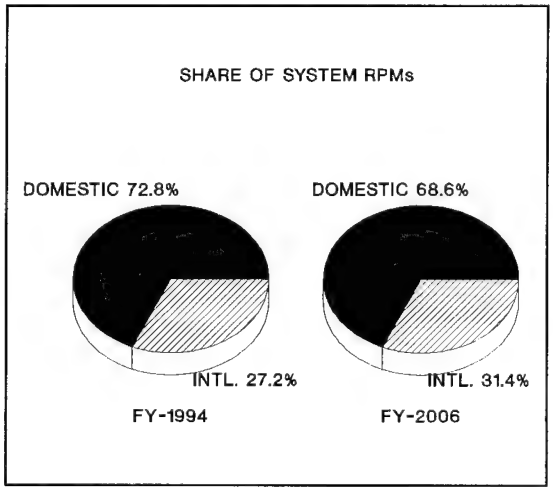
- o the strength and duration of the current U.S. economic recovery;
- o the number of business cycles that occur over the forecast period;
- o future oil price shocks;
- o the strength and duration of economic growth in Europe and Japan;
- o structural changes in the international markets that affect U.S. carrier shares;
- o the devaluation of the peso;
- o the liberalization of bilateral agreements with Canada;
- o how far carriers can reduce unit costs (goal of major carriers is to match Southwest's 7.5 cents/ASM);
- o how fast yields decline because of increased competition and cost reductions;
- o when the industry reaches equilibrium; and
- o how many carriers survive.

In addition, the network of bilateral pacts that the United States currently has in place in Europe, the Far East, and South America could significantly inhibit the expansion plans (current and future) of air carriers operating in these international regions and restrain traffic growth.

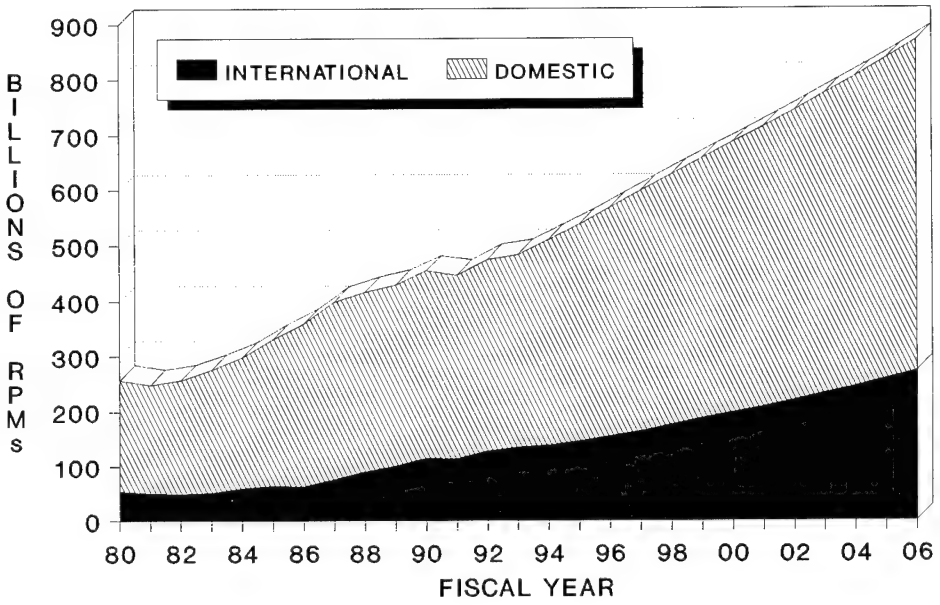
REVENUE PASSENGER MILES

U.S. scheduled air carriers recorded a total of 509.9 billion revenue passenger miles in fiscal year 1994, up 5.5 percent. System passenger miles are forecast to increase 5.3 percent in 1995, then increase 5.6 percent in 1996 and taper off thereafter through the balance of the forecast period. Average annual growth in system RPMs is expected to be 4.5 percent.

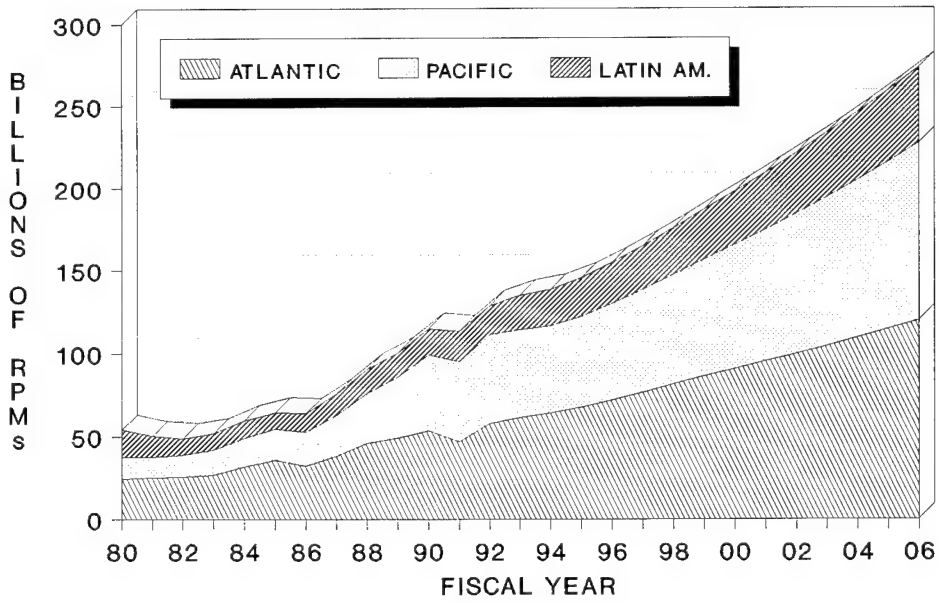
International growth is anticipated to be somewhat higher than domestic growth, with the average annual international growth in RPMs during the 12-year forecast period being 5.8 percent, compared to 4.0 percent for the domestic market. In the year 2006, the international share of the U.S. carriers' system RPMs is expected to be 31.4 percent, up from 27.2 percent in 1994, and 21.1 percent in 1980.



U.S. COMMERCIAL AIR CARRIERS
SCHEDULED REVENUE PASSENGER MILES



SCHEDULED INTERNATIONAL RPMS
BY TRAVEL REGION



Domestic Revenue Passenger Miles

Scheduled domestic revenue passenger miles totaled 371.4 billion in fiscal year 1994, up 6.5 percent from 1993. Domestic traffic is projected to increase 5.4 percent in 1995 with RPMs totaling 391.5 billion, up 5.4 percent. The relatively strong traffic growth in 1995 is largely influenced by growth of the U.S. general economy and continued growth of the new-entrant low-cost carriers in the short-haul market.

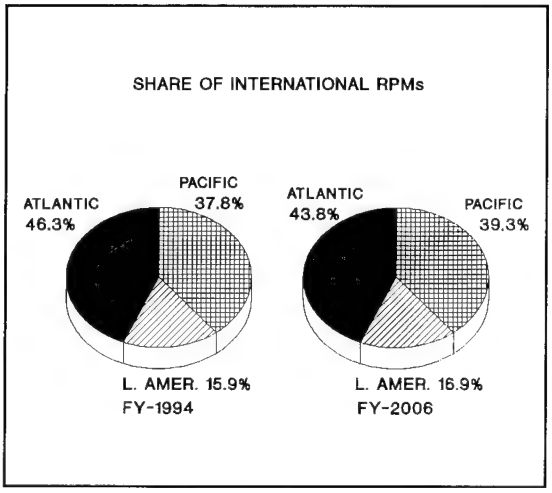
In 1996, traffic is expected to increase 5.3 percent, and in 1997 by 5.0 percent. Traffic is then expected to taper gradually over the balance of the forecast period. Average annual increase in domestic RPMs is estimated at 4.0 percent.

International Revenue Passenger Miles

International RPMs grew 2.8 percent in 1994. The growth was uneven, however, with increases of 6.0 percent in Latin American markets and 4.2 percent in Atlantic markets, and a decline of 0.2 percent in Pacific markets.

Total RPMs in international markets are expected to approximately double during the forecast period, increasing from 138.5 billion in 1994 to 273.1 billion in 2006. The average annual growth rate over this period is 5.8 percent. This is 1.8 percentage points higher than the domestic growth rate and continues a trend that will see a greater percentage of system RPMs in the international market.

International RPMs are forecast to increase to 145.5 billion in 1995, up 5.0 percent, and to 154.7 billion in 1996, up 6.3 percent.



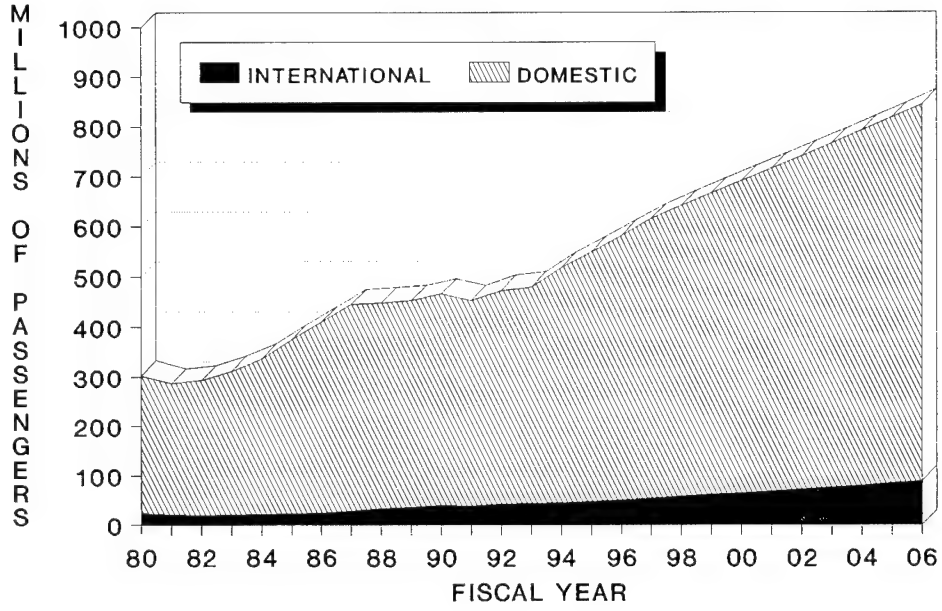
The relative importance of international market areas is expected to change during the forecast period, with Atlantic RPMs decreasing from 46.3 percent of the total in 1994 to 43.8 percent in 2006. The Pacific RPMs share increases from 37.8 percent in 1994 to 39.3 percent in 2006. Latin American RPMs increase from 15.9 percent in 1994 to 16.9 percent in 2006. These changes result from the differing market growth rates anticipated during the forecast period.

The RPMs for the Atlantic, Pacific, and Latin America markets are shown in Chapter IX, Tables 12 and 14.

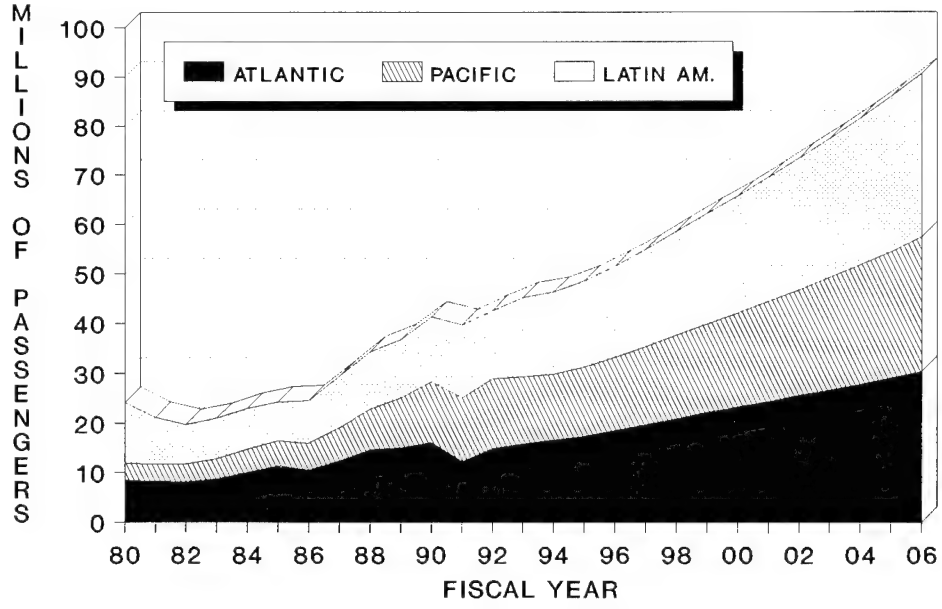
PASSENGER ENPLANEMENTS

In fiscal year 1994, U.S. scheduled air carriers enplaned a total of 518.3 million passengers, up 8.2 percent. The continued growth of the U.S. economy along with domestic short-haul activity is expected to result in strong traffic growth in 1995, 1996, and 1997. The market is expected to stabilize after 1997 with slower growth expected throughout the forecast period. System passenger enplanements are forecast to increase to 549.6 million in 1995, up 6.0 percent, with increases of

U.S. COMMERCIAL AIR CARRIERS
SCHEDULED PASSENGER ENPLANEMENTS



SCHEDULED INTERNATIONAL ENPLANEMENTS
BY TRAVEL REGIONS

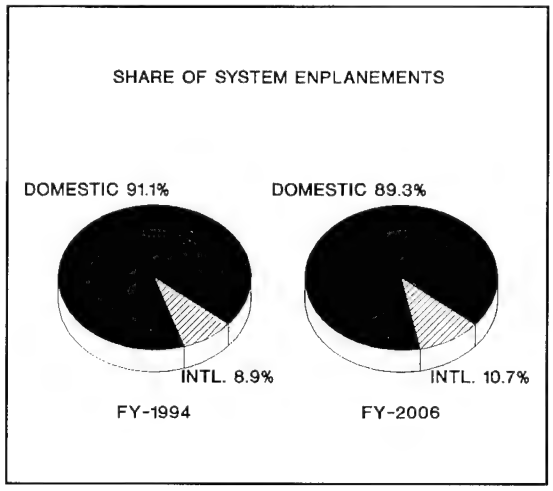


5.9 percent in 1996, and 5.7 percent in 1997. Thereafter, the growth rate will taper off. Overall average annual growth of enplanements for the 12-year forecast period is expected to be 4.2 percent.

Enplanements grow at a slightly lower rate than RPMs because of the gradual increase in average trip length. In 1994, 91.1 percent of enplanements were domestic. This will drop to 89.3 percent in 2006.

Domestic Passenger Enplanements

U.S. scheduled domestic air carriers enplaned a total of 472.0 million passengers in fiscal year 1994, up 8.7 percent. Domestic passenger enplanements are forecast to increase to 501.0 million in fiscal year 1995, up 6.1 percent.



Domestic passenger enplanements are forecast to increase gradually over the forecast period, at about the same rate as RPMs.

The projected growth in domestic enplanements is expected to average 4.0 percent annually during the 12-year forecast period, with the number of domestic enplanements reaching 754.3 million in fiscal year 2006.

International Passenger Enplanements

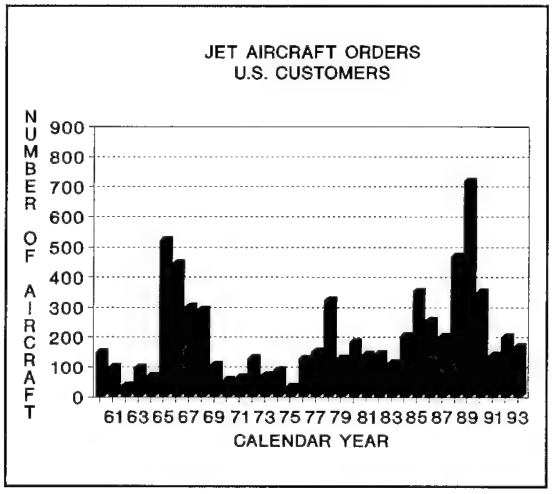
A total of 46.3 million passengers were enplaned by U.S. scheduled international airlines in fiscal year 1994, up 2.4 percent. International enplanements are forecast to increase to 48.6 million in 1995, up 5.0 percent.

Enplanements will grow at about the same rate as RPMs. The average annual rate of growth during the forecast period will be 5.8 percent.

The individual international markets will all see significant growth during the forecast period, with Latin American enplanements increasing 6.0 percent annually over the forecast, Pacific increasing 6.0 percent, and Atlantic increasing 5.2 percent annually.

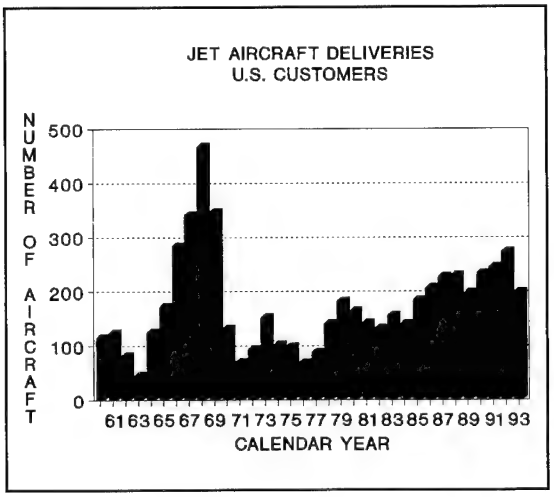
AIR CARRIER FLEET

World air carriers placed orders for an estimated 318 large jet aircraft with U.S. and foreign aircraft manufacturers during 1994, 18.5 percent fewer orders than in fiscal year 1993. Of this total, 182 (57.2 percent) were for two-engine narrowbody (B-737, B-757, MD-80, A-320, and F-100) aircraft.



Aircraft manufacturers delivered approximately 518 large jet aircraft worldwide in 1994. Of this total, 325 (62.7 percent) were two-engine narrowbody aircraft.

Looking at the year ending December



1994, the fleet for U.S. air carriers increased by an estimated 48 aircraft, an increase of 1.1 percent. This compares to 1993, when the fleet increased by 163 aircraft. Fleet changes in 1994 were similar to changes which occurred in 1993, namely a steep increase in stage-3 aircraft (up 288 aircraft or 11.5 percent) and a decline in stage-2 aircraft (down 244 aircraft or 13.7 percent).

This forecast assumes a 25-year life cycle for aircraft, but also follows guidelines of the national noise legislation. In particular, stage-2 aircraft will be withdrawn from the U.S. fleet by the end of 1999, although waivers could possibly delay some withdrawals until the end of 2003.

At the end of 1994, there were approximately 1,531 stage-2 aircraft (34.2 percent of the total fleet) remaining in the U.S. air carrier jet fleet. The forecast reflects a decreasing number of stage-2 aircraft in the fleet in each year, declining to zero in 2000. Numerous changes were made in the fleet plans of air carriers in fiscal year 1994. The major effects of these changes are to reduce the number of aircraft on order and option, and to delay delivery of aircraft on order. Additional carrier fleet plans will stretch out the life of some existing stage-2 aircraft. These changes have been incorporated into the fleet forecast. The forecast goes beyond the period covered by existing fleet plans, so future aircraft deliveries are assumed adequate to serve the forecast of demand.

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, and fleet requirements, the U.S. commercial air carrier fleet is projected to increase from an inventory of 4,426 aircraft on January 1, 1994, to 6,531 aircraft by January 1, 2006. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 175 aircraft annually (3.3 percent annually).

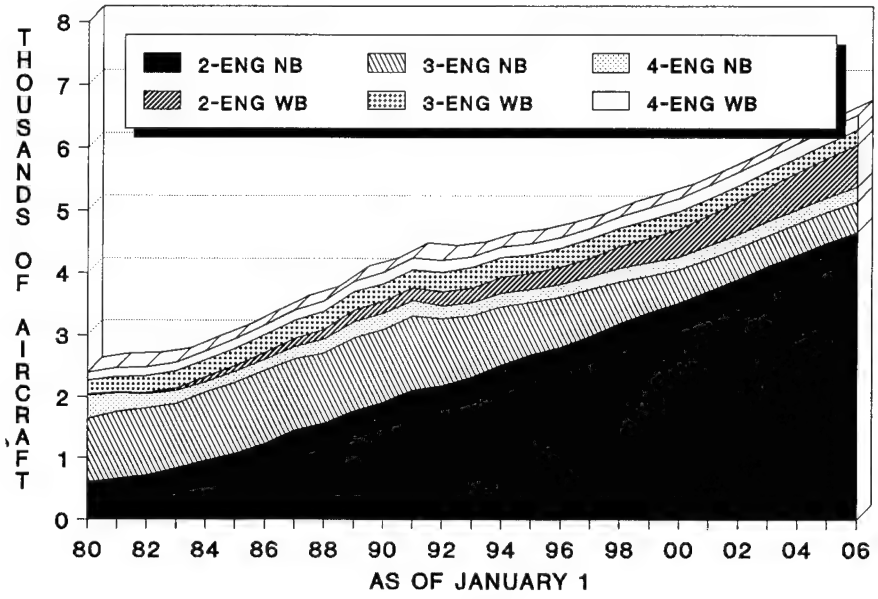
By far the largest increase, in terms of number of aircraft, is projected to occur in the two-engine narrowbody aircraft category, which is expected to grow by an average of 178 aircraft (5.2 percent) annually. By the year 2006, two-engine narrowbody aircraft are expected to total 4,661 units and to account for 71.4 percent of the fleet, up from 57.1 percent in 1994.

Three-engine narrowbody (B-727) aircraft are expected to decline from 935 aircraft (21.1 percent of fleet) in 1994 to 490 (7.5 percent of fleet) in the year 2006. All of these must be modified by 2000 to satisfy noise regulations. Four-engine narrowbody aircraft will increase moderately, from 217 aircraft in 1994 to 235 aircraft in 2006. Growth in this group results from additions of BAE-146 aircraft.

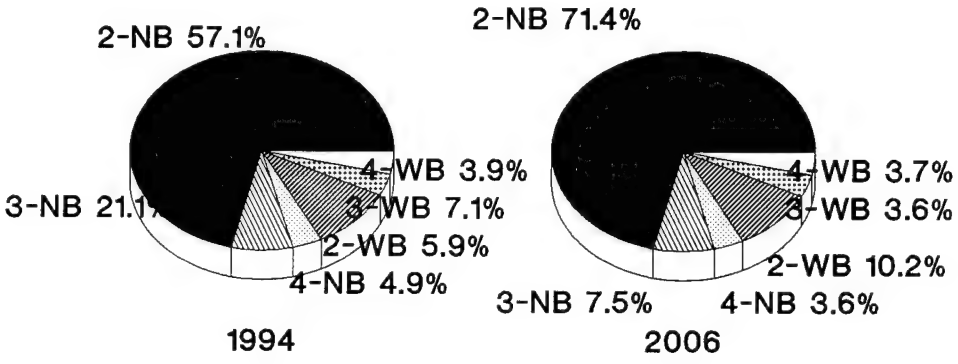
Widebody aircraft, which accounted for 16.9 percent of the fleet in 1994, are expected to account for 17.5 percent in 2006. The two-engine widebody fleet (A-300/310/330, B-767, and B-777)

U.S. COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT



PERCENT BY AIRCRAFT TYPE



aircraft are the fastest growing of the widebody group. These are expected to increase by an average of 34 aircraft per year (8.1 percent), from 263 aircraft in 1994 to 668 aircraft in 2006.

Four-engine widebody (B-747 and A-340) aircraft are forecast to increase from 170 aircraft in 1994 to 243 aircraft in 2006, an annual increase that averages 3.0 percent. The three-engine widebody fleet (MD-11, DC-10, and L-1011) is projected to decrease over the forecast period, from 315 aircraft in 1994 to 234 in 2006, an average of 2.8 percent annually. The forecast assumes that when additions to capacity are needed, the carriers will add smaller aircraft, and not bring back the three-engine widebody aircraft.

AIRBORNE HOURS

U.S. commercial air carriers flew an estimated total of 11.2 million hours in fiscal year 1994, up from 11.1 million hours in 1993. Two aircraft categories accounted for over three-fourths of total airborne hours: two-engine narrowbody aircraft (62.2 percent) and three-engine narrowbody (14.5 percent). In fiscal year 2006, the number of hours is forecast to increase to 17.8 million, an average annual increase of 3.9 percent.

Airborne hours are forecast to increase 1.5 percent in 1995 to 11.4 million, and 2.5 percent in 1996, to 11.7 million. Airborne hours generally increase at rates similar to the rate of growth of traffic, with some adjustment made for moderate increase in the average aircraft size.

Two-engine aircraft (both narrowbody and widebody) are projected to account for 87.8 percent of all airborne hours flown in fiscal year 2006. Narrowbody two-engine aircraft make up 73.4 percent of hours in 2006, up an average of 5.4 percent per year. Widebody two-engine aircraft make up 14.5 percent of the hours in 2006, up an average of 8.6 percent per year.

The share and the number of hours flown by three-engine widebody aircraft are forecast to decrease during the forecast period, based on known plans for carriers to reduce the number of aircraft in this group. The share for four-engine widebody aircraft will also decrease, from 4.6 percent in 1994 to 4.2 percent in 2006, although the hours increase by an average annual rate of 3.2 percent.

The number of hours flown by three-engine narrowbody aircraft will decline significantly over the forecast period, as will the hours. Hours for this aircraft type drop from 1.6 million in 1994 to 0.5 million in 2006, or 66.8 percent. This reflects the retirement of large numbers of B-727 aircraft during the forecast period. Hours for the four-engine narrowbody fleet, made up primarily of DC-8's, are expected to show small increases during the period.

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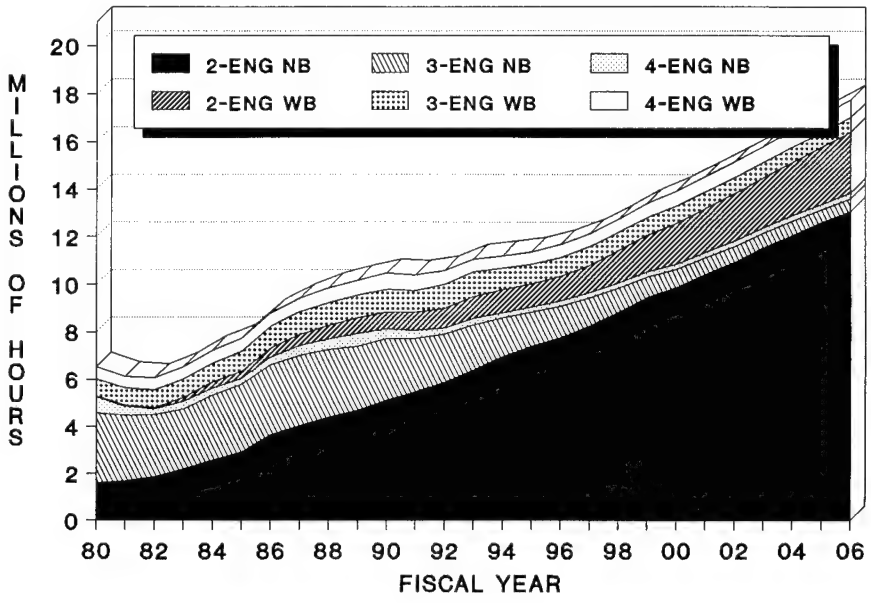
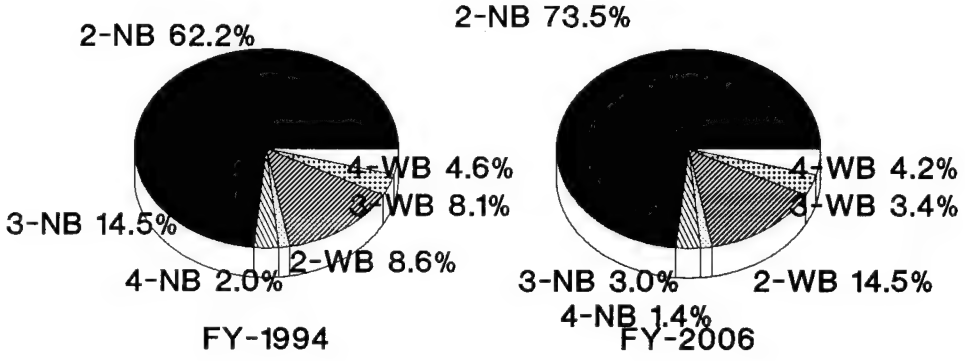
U.S. COMMERCIAL AIR CARRIERS

AIRBORNE HOURS



PERCENT DISTRIBUTION BY AIRCRAFT TYPE



CHAPTER IV
REGIONALS/COMMUTERS

CHAPTER IV

REGIONALS/COMMUTERS

The regional/commuter airline industry, for the purpose of this forecast, is defined as those air carriers that provide regularly scheduled passenger service and whose fleets are composed predominantly of aircraft having 60 seats or less. During 1994, 128 regional/commuter airlines reported traffic data to RSPA on Form 298-C and Form 41 (A listing of these carriers is presented in Appendix E).

The FAA historical data base includes activity for all regional/commuters operating in the 48 contiguous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands. Excluded from the data base is activity in Alaska, other U.S. territories, and foreign territories. Alaskan activity is excluded from the forecast because of its unique operating environment and the service characteristics compared the rest of the U.S.

Additionally, the regional/commuter traffic statistics include duplicated enplanement and revenue passenger miles data for selected operators included in the commercial air carrier traffic statistics. The duplication is for those air carriers operating both large turboprop and turbojets (over 60 seats) and commuter type aircraft. The level of duplicated traffic statistics are presented in the technical notes at the beginning of Chapter IX for Table 10 and Table 19, and the carrier are identified in Appendix E.

REVIEW OF 1994

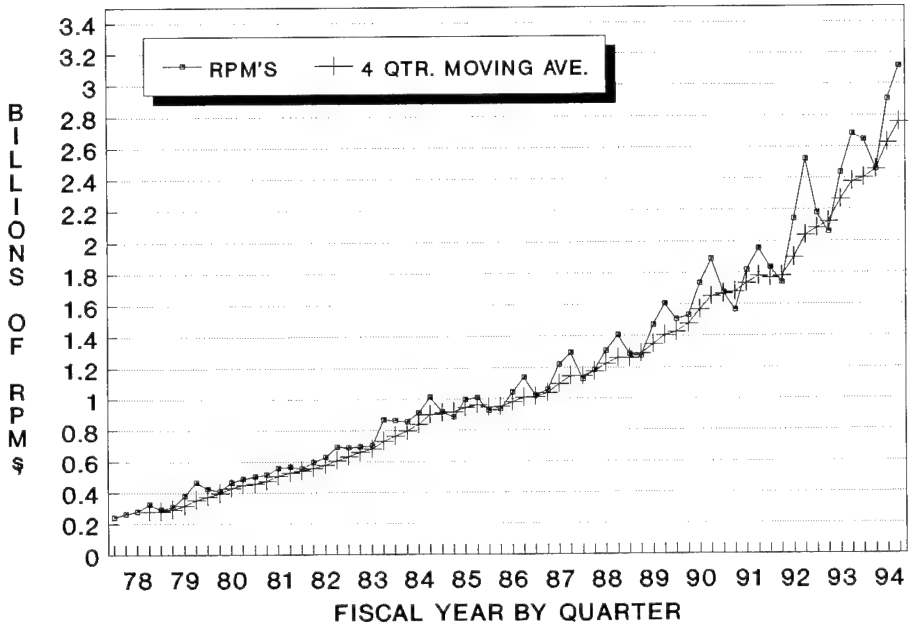
Since 1984, the regional/commuter airline industry has been in a period of transition. In 1985, there was a dramatic growth in the number of code-sharing agreements with the major air carriers. This was followed in 1986 by a wave of large jet air carrier acquisitions of, or equity interest in, their regional/commuter code-sharing partners. The evolution of the relationships with the large air carriers has led to further route rationalization policies on the part of the larger partner in the form of transferring an increasing number of short haul jet routes to their regional partners, which has sustained the regional industry's high rate of growth. Together, these actions have resulted in a process of industry consolidation, increasing concentration, and increasing integration with the large commercial air carriers that has continued through 1994.

INDUSTRY SUMMARY

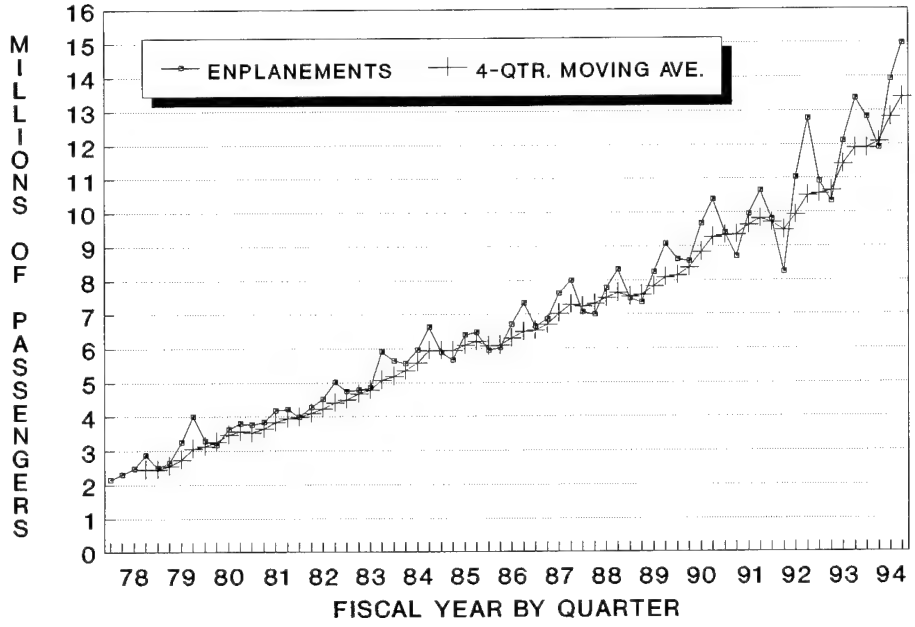
During fiscal year 1994 the number of regional/commuter airlines totaled 128, compared to 136 in 1993. While the number of reporting airlines declined, industry growth continues to out-pace the growth of the larger air carriers.

U.S. REGIONALS/COMMUTERS TRAFFIC TRENDS

REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



REVENUE PASSENGER ENPLANEMENTS

Total revenue passenger enplanements for the regional/commuter airlines, including Alaska and foreign territories, totaled 56.0 million, an increase of 14.5 percent compared to 1993. Excluding Alaska and foreign territories, enplanements totaled 53.6 million, up 14.8 percent over 1993.

For the 48 contiguous states, enplanements increased 15.3 percent to 52.0 million. Enplanements in Hawaii, Puerto Rico, and the Virgin Islands totaled 1.6 million--unchanged from the level reported in 1993.

The level of enplanements in Hawaii decreased 3.4 percent compared to 1993. During the same period, enplanements in Puerto Rico and the Virgin Islands posted an increase of 6.0 percent.

While not included in the forecast base, enplanements in Alaska and other U.S. and foreign territories totaled 2.4 million, an increase of 9.1 percent compared to 1993. Enplanements in Alaska increased 14.0 percent in 1994, while enplanements in the other territories increased 4.7 percent.

REVENUE PASSENGER MILES

Revenue passenger miles (RPMs) totaled just under 11.6 billion in 1994, an increase of 17.4 percent from 1993. For the 48 states, revenue passenger miles increased 19.2 percent in 1994 to just under 11.0 billion. The reason for the significantly higher growth in RPMs relative to passenger enplanements is that the average passenger trip length increased by 6.8 miles in 1994 to 211.0 miles.

Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands increased just under 0.9 percent to 142.9 million, while in Alaska and other territories, revenue passenger miles totaled 352.4 million, an increase of 2.4 percent compared to 1993.

INDUSTRY COMPOSITION

The fundamental character of the regional/commuter industry has changed dramatically since the mid-1980s. These changes range from the relative size and sophistication of airline operations, the players involved (especially the dominant industry operators), and aircraft fleets, to the industry's relationship with the large commercial air carriers in the national air transportation system. While the role of the industry, in the past and today, is to provide feeder service to the large hubs served by the large commercial air carriers, the exact scope and relationships of its role has changed dramatically.

In 1994 the composition of the regional/commuter airline industry continued to evolve. The factors contributing to this change included economic and competitive influences, marketing strategies and alliances. Two distinct but interrelated trends form the basis for the changing character and composition of the industry since the mid-1980s. They are industry consolidation and increasing integration of operations with the larger air carriers.

INDUSTRY CONSOLIDATION

From a high of about 250 carriers in 1981, the number of regional/commuter operators has declined to 128 in 1994. The 128 operators in 1994 represents a

TOP 50

REGIONAL/COMMUTER AIRLINES

RANKED BY TOTAL PASSENGER ENPLANEMENTS

FISCAL YEAR 1994

1. Flagship Airlines
2. Simmons Airlines
3. Continental Express
4. Horizon
5. Comair
6. Atlantic Southeast
7. Piedmont Airlines
8. Mesa Airlines
9. WestAir
10. Allegheny Commuter
11. SkyWest Aviation
12. Business Express
13. Trans States Airlines
14. Atlantic Coast Airlines
15. Wings West Airlines
16. Mesaba Aviation
17. Executive Airlines
18. Express Airline I
19. Jetstream International
20. CCAir
21. Trans World Express
22. Great Lakes Aviation
23. United Feeder Service
24. Commutair
25. Express Airline II
26. Chautauqua Airlines
27. Air Midwest
28. ERA Aviation
29. Aloha IslandAir
30. Scenic Airlines
31. Paradise Island
32. MarkAir Express
33. Cape Air
34. Northeast Express Regional*
35. Sunaire*
36. Empire Airlines
37. GP Express Airlines
38. Crown Air*
39. Gulfstream International
40. Conquest Airlines
41. Astral Aviation
42. Chicago Express Airlines
43. Peninsula Airways
44. Air Vegas
45. Viequies Air Link
46. Lone Star Airlines
47. Precision Airlines*
48. Pacific Island Aviation
49. Air Nevada
50. Grand Airways

* These reporting entities were no longer operating at the end of FY 1994.

Source: RSPA Form 298-C and Form 41 enplanement data

TOP 30 CORPORATE STRUCTURES

Carrier/ Carrier Group	Percent of Industry Enplanements	Carrier/ Carrier Group	Percent of Industry Enplanements
1. American Eagle	19.9	16. Chautauqua	.7
2. Delta Connection	13.7	17. ERA Aviation	.6
3. USAir Express	10.0	18. Aloha IslandAir	.6
4. Mesa	8.3	19. Northeast Express	.5
5. Continental Express	5.9	20. Scenic Airlines	.5
6. Alaska	5.6	21. Paradise Island	.5
7. Trans States	3.9	22. Cape Air	.4
8. Business Express	3.0	23. MarkAir Express	.4
9. Atlantic Coast	2.6	24. Sunaire	.3
10. Express Airlines	2.5	25. Empire Airlines	.3
11. Mesaba Aviation	2.1	26. GP Express	.3
12. CCAir	1.3	27. Gulfstream Internat'l	.3
13. Trans World Express	1.2	28. Conquest Airlines	.2
14. Great Lakes	1.2	29. Astral Aviation	.2
15. Commutair	.9	30. Chicago Express	.2

drop of eight carriers compared to 1993 when 136 carriers reported traffic data to RSPA. Of the 136 carriers that reported traffic data in 1993, 124 were in operation at the end of the year. Of the total of 128 carriers that operated in 1994, 123 were still in operation at the end of the year. Because of the increased integration of operations with the large air carriers (through code-sharing agreements and acquisition of regionals totally or in part), the success of many regionals is tied closely to the success of their larger partners. At the present time, there is no reason to assume that the trend towards greater consolidation of the regional/commuter industry will not continue.

INDUSTRY CONCENTRATION

While the number of carriers has declined, the size of the dominant industry carriers has increased dramatically. This has resulted in increased industry concentration, with the top 50 carriers accounting for approximately 97.5 percent of total industry passenger enplanements in 1994, basically unchanged from 1993. While total industry enplanements increased by 14.5 percent in 1994, the top 50 carriers grew at a slightly higher rate (15.2 percent). The top 50 carriers for 1994 are listed in the table on page IV-4. Although the relative ranking has changed for many carriers, the composition of the group is basically unchanged from 1993.

AIR CARRIER/COMMUTER AIRLINES
CODE-SHARING AGREEMENTS

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
1. Alaska Airlines	Horizon*	Boise Portland Seattle Spokane
	Trans States	Los Angeles San Francisco
2. Aloha Airlines	Aloha IslandAir	Honolulu
3. America West Express	Mesa	Columbus Phoenix
4. American Eagle	Executive Airlines*	San Juan
	Flagship Airlines	Boston Miami Nashville New York
	Simmons*	Dallas/Ft. Worth Chicago
	Wings West	Los Angeles San Jose
5. Continental Express	Continental Express*	Cleveland Houston Newark
6. Delta Connection	Atlantic Southeast*	Atlanta Dallas/Ft. Worth
	Business Express*	Boston New York
	Comair	Cincinnati Florida
	SkyWest	Los Angeles Salt Lake City
7. Midwest Express	Astral Aviation	Milwaukee
8. Northwest Airlink	Business Express*	Boston
	Express Airlines I	Memphis Minneapolis/St. Paul
	Express Airlines II	Minneapolis/St. Paul

AIR CARRIER/ COMMUTER AIRLINES
CODE-SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
8. Northwest Airlink (Continued)	Horizon*	Portland
		Seattle
	Mesaba	Detroit
		Minneapolis/St. Paul
	Trans States*	Los Angeles
		San Francisco
9. Trans World Express	Alpha Air	Los Angeles
	Trans States*	St. Louis
	Trans World Express	New York
10. United Express	Atlantic Coast	Washington, D.C.
	Great Lakes	Chicago
	Gulfstream Internat'l	Miami
	Mesa	Denver
		Portland
		Seattle
	WestAir	Los Angeles
		San Francisco
	United Feeder Service*	Chicago
11. USAir Express	Air Midwest	Kansas City
	Allegheny Commuter	Baltimore
		Pittsburgh
		Philadelphia
	CCAir	Charlotte
	Chautauqua	Orlando
		Pittsburgh
	Commutair	Boston
		New York
		Syracuse
	Jetstream	Baltimore
		Indianapolis
	Mesa	Pittsburg
		Tampa
	Piedmont	Baltimore
		Charlotte
		Florida
		Philadelphia
	Trans States*	Los Angeles

* Carrier operates both large aircraft (over 60 seats), and commuter aircraft.

The above data are based on RSPA Form 298-C and Form 41 reporting entities. However, looking at the industry only in this manner does not truly reflect the level of industry consolidation, concentration, and integration with the large air carriers. Some of the regionals are owned, totally or in part, by their larger code-sharing partners, and still others are owned by other regionals. A better picture of the current industry composition is presented by looking at the industry from a corporate structure point of view. A total of 16 regionals are owned, totally or in part, by nine of the larger air carriers, and six more are owned by four other regionals. The table at the top of page IV-5 presents the top 30 corporate structures and their percentage share of 1994 industry enplanements. Viewed in this manner, it can be seen that there is a much higher level of industry concentration and a higher degree of integration with the large commercial airlines. In 1994, enplanements for these carriers grew by 15.0 percent and accounted for 96.3 percent of total industry enplanements. Excluding the carriers which ceased operating during 1994, enplanements for this group of carriers increased 16.2 percent in 1994 and they accounted for 95.4 percent of total industry enplanements.

FORECAST ASSUMPTIONS

Industry growth is expected to continue to out-pace that of the larger air carriers and be driven by increased demand. The introduction of new state-of-the-art aircraft offering amenities similar to those found on large jet aircraft is expected to contribute to greater public acceptance and stimulate higher growth. Increasing integration of service with the larger commercial air carriers, together with the introduction of new aircraft, is expected to lead to further route rationalization programs by the larger air carriers, opening new opportunities for growth for the regional/commuter industry. While there are risks, the regional airline industry is expected to benefit from continued service integration with the larger air carriers and the introduction of larger aircraft. This will create new opportunities for growth through service substitution and expansion in markets currently served with large jet aircraft.

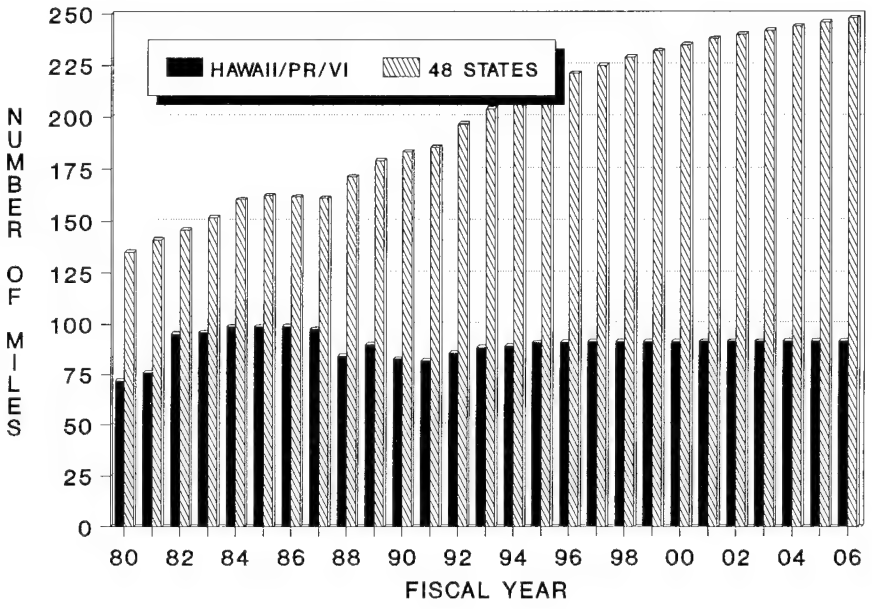
While the average passenger trip length is expected to increase during the forecast period, the regional/commuter carriers will continue to serve primarily short-haul markets. The emphasis, however, will be on improved quality and schedule frequency in the markets best suited to their operations.

It is expected that the aircraft fleet will continue to grow during the forecast period. The average seats per aircraft is expected to increase from 23.7 in 1994 to 24.1 in 2006, an average annual growth of approximately 3.3 percent per year. The most significant change in the fleet composition will result from the introduction of regional jet aircraft, many of which fall in the "40 to 60 seat" category. These aircraft will contribute to increased public acceptance of regional airline service, and will offer greater potential for replacement service on selected jet routes.

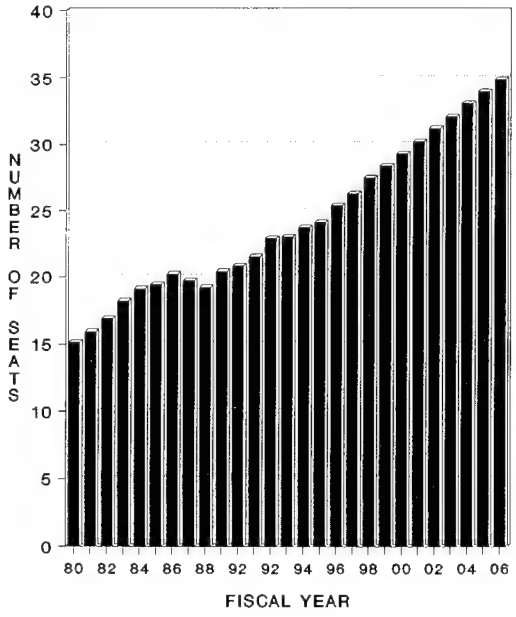
The average passenger trip length in the 48 states is projected to increase from 211.0 miles in 1994 to 248.0 miles in 2006, an average annual growth rate of 1.4 percent. The average trip length for Hawaii, Puerto Rico, and the Virgin Islands is expected to increase from 89.3 miles in 1994 to 91.8 miles in 2006, an average annual growth rate of 0.2 percent for the forecast period. The growth in the average passenger trip length and resulting growth in RPMs will be driven by the increased introduction of regional jet aircraft.

U.S. REGIONALS/COMMUTERS
FORECAST ASSUMPTIONS

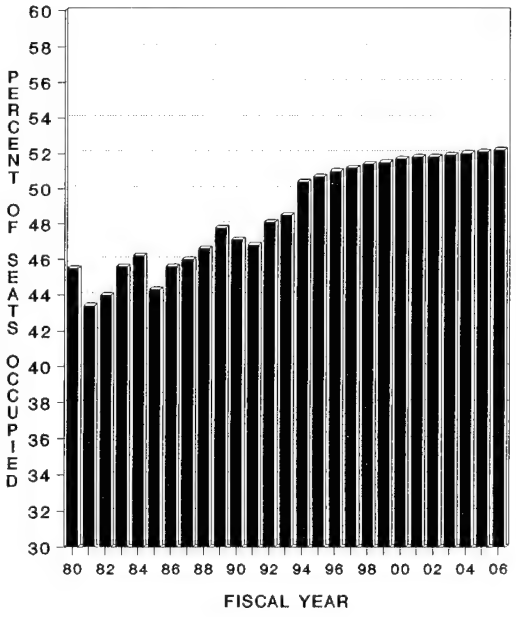
PASSENGER TRIP LENGTH



AVERAGE AIRCRAFT SIZE

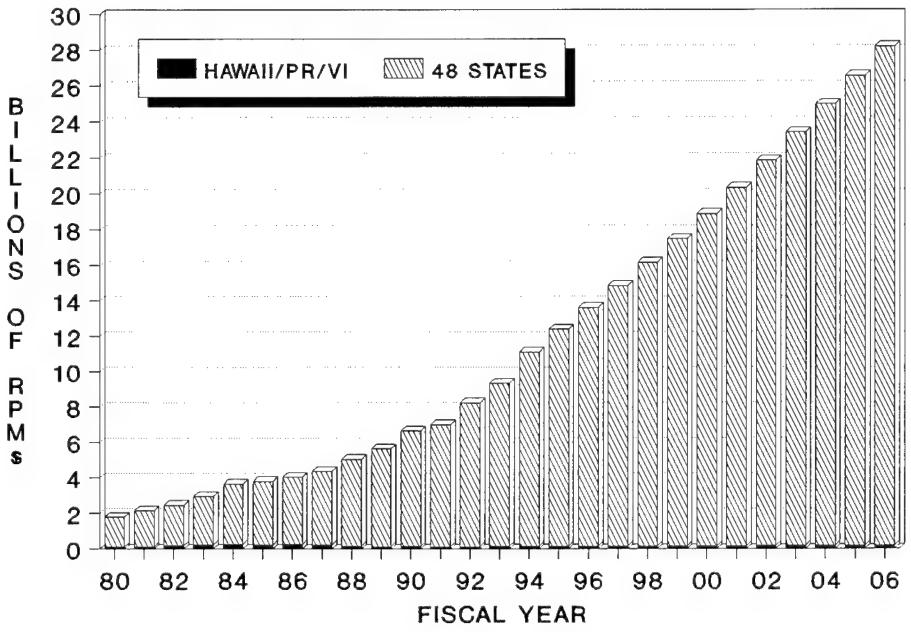


PASSENGER LOAD FACTOR

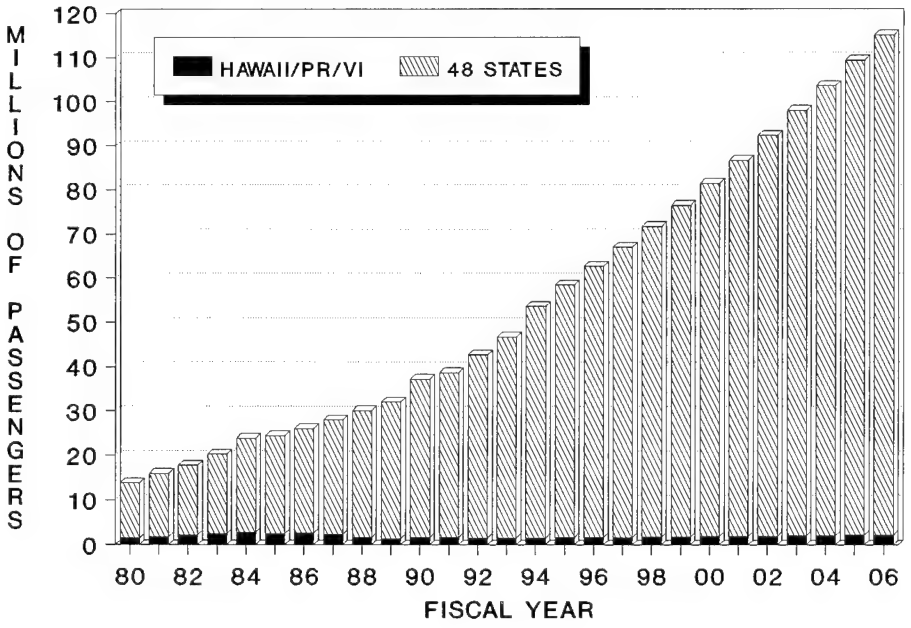


U.S. REGIONALS/COMMUTERS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



With increased speed and capacity, these aircraft will contribute to an expanded market area that can be served on a timely and efficient basis by the regional airline industry.

The average industry load factor is expected to increase only slightly from 50.4 in 1994 to 52.2 in 2006, reflecting a continuing emphasis on frequency of service.

It should also be noted that no assumptions have been made concerning the potential impact of the proposed rule to require all Part 135 regional/commuter airlines to operate under Part 121 operating standards. Additionally, no assumptions or changes have been made to account for the impact of the negative publicity resulting from the temporary grounding of ATR aircraft that occurred in late 1994, and which was rescinded on January 11, 1995.

The baseline assumptions for the average seats per aircraft, passenger trip length, and load factors are presented in Chapter IX, Table 18.

REGIONAL/COMMUTER FORECASTS

REVENUE PASSENGER MILES

Revenue passenger miles are projected to increase to 12.4 billion (up 11.6 percent) in 1995 and to 13.6 billion (up 9.8 percent) in 1996. Passenger miles are expected to increase at an average annual rate of 8.1 percent during the 12-year forecast period, totaling 28.2 billion in 2006.

Passenger miles in the 48 states are projected to increase to 12.2 billion (up 11.6 percent) in 1995 and to 13.5 billion (up 9.9 percent) in 1996. During the 12-year forecast period passenger miles are expected to increase at an average annual rate of 8.1 percent, totaling 28.0 billion in 2006. Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands are projected to increase to 154.7 million (up 8.3 percent) in 1995 and to 155.0 million (up 0.2 percent) in 1996. During the forecast period passenger miles are expected to grow at an average annual rate of 2.9 percent, totaling 202.0 million in 2006.

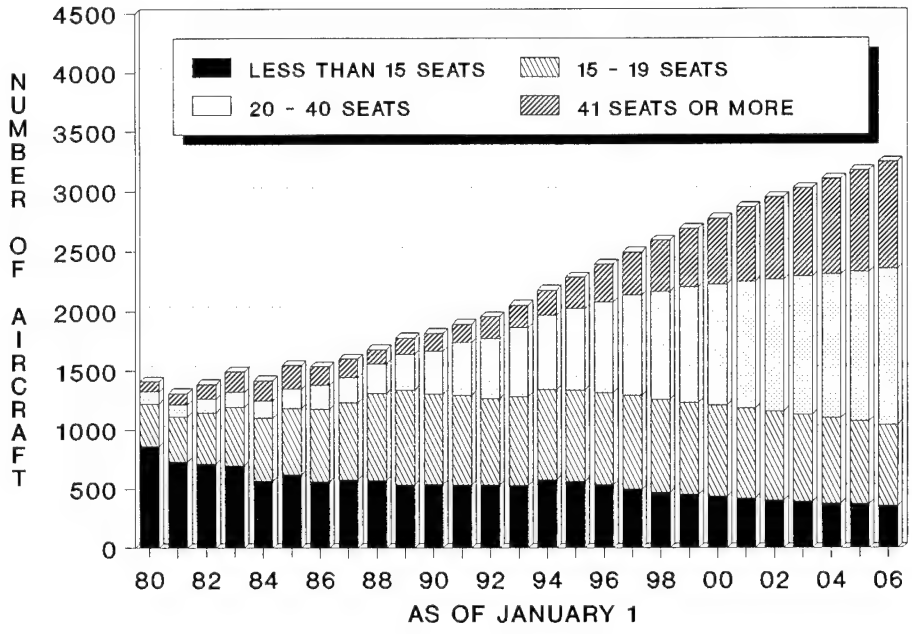
REVENUE PASSENGER ENPLANEMENTS

Passenger enplanements are projected to increase to 58.4 million (up 9.0 percent) in 1995 and to 62.6 million (up 7.2 percent) in 1996. Passenger enplanements are expected to increase at an average annual rate of 6.6 percent during the 12-year forecast period, totaling 115.1 million in 2006.

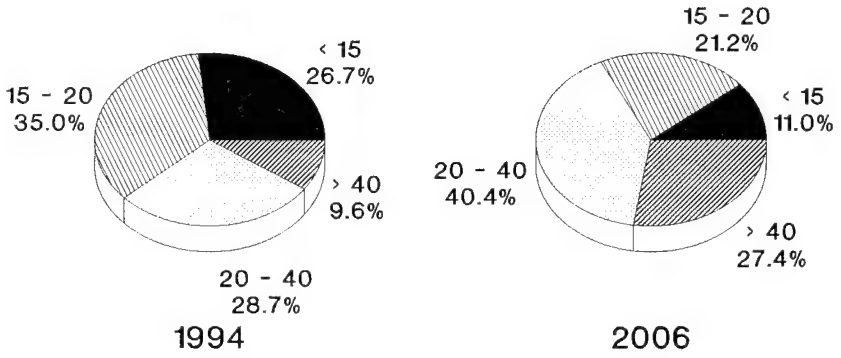
Passenger enplanements in the 48 states are projected to increase to 56.7 million (up 9.0 percent) in 1995 and to 60.9 million (up 7.4 percent) in 1996. During the 12-year forecast period, passenger enplanements are expected to increase at an average annual rate of 6.7 percent, totaling 112.9 million in 2006. Passenger enplanements in Hawaii, Puerto Rico, and the Virgin Islands are projected to total 1.7 million in 1995 and 1996, unchanged from the level from the 1994 level During the forecast period, passenger enplanements are expected to increase at an average annual rate of 2.7 percent, totaling 2.2 million in 2006.

U.S. REGIONALS/COMMUTERS

PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT SEAT SIZE



REGIONAL/COMMUTER FLEET

The current composition of the regional/commuter fleet underscores the growth of the industry and quality of service provided. From a fleet once composed predominantly of general aviation type aircraft, today's fleet is increasingly composed of new state-of-the-art aircraft offering amenities similar to those found on large jet aircraft. Today's regional/commuter airlines have a large variety of aircraft from which to choose. Consequently, they can tailor their fleet to the specific markets they serve.

While there are numerous aircraft models to choose from in the categories presented in this forecast, the most significant are the new aircraft with larger seating capacities--primarily the "20 to 40 seats" and the "greater than 40 seats" categories. The introduction of the larger new aircraft is reflected in the growth of the average seats per aircraft from 15.1 in 1980 to 23.7 in 1994, an increase of 57.0 percent, while the regional fleet grew by only 54.5 percent reflecting growth in the average seat size per aircraft.

During the forecast period, it is projected that the average seats per aircraft will continue to grow at a rate roughly comparable to the rate of growth in the fleet. The growth in the average seat size of the fleet is based on the projected fleet growth and its composition by aircraft size categories. This reflects the continued introduction of larger aircraft into the fleet. The fleet is projected to grow at an average annual rate of 3.4 percent, increasing from 2,179 aircraft in 1994 to 3,250 aircraft in 2006.

The number of aircraft having less than 15 seats--which once made up the bulk of the fleet--totaled 581 in 1994, and accounted for 26.7 percent of the fleet. Between 1994 and 2006, the number of aircraft in this category is expected to decline to 357, a drop of 61.4 percent. By 2006 it will represent only 11.0 percent of the total fleet.

In 1994, the "15 to 19 seats" category accounted for the largest portion of the fleet (35.0 percent). During the last 10 years, most of the growth of the regional/commuter fleet has occurred in this category. However, this group is expected to decline steadily in the mid to later forecast period. It is projected that the "15 to 19 seats" category will decline from 763 aircraft in 1994 to 688 in 2006. However, this aircraft group will still account for 21.2 percent of the fleet in 2006.

The greatest growth in the fleet is expected to be in the "20 to 40 seats" and "greater than 40 seats" categories. This is due to the continued substitution of service and new route opportunities created through the use of larger, longer range aircraft. In 1994, aircraft in the "20 to 40 seats" category accounted for 28.7 percent of the regional fleet, while aircraft in the "greater than 40 seats" accounted for 9.6 percent. By the year 2006, these two categories are expected to account for a combined 67.8 percent of the total fleet, with 40.4 percent being in the "20 to 40 seats" category and the "greater than 40 seats" category accounting for 27.4 percent. During the forecast period, aircraft in the "20 to 40 seats" category are expected to increase from 620 aircraft in 1994 to 1,313 in 2006, an average annual increase of 6.4 percent. Aircraft in the "greater than 40 seats" category are expected to increase from 209 in 1994 to 892 in 2006, an average annual growth of 12.9 percent.

FLIGHT HOURS

Regional/commuter flight hours, as reported on RSPA Form 298-C, totaled just under 3.0 million hours in 1994, up 1.7 percent compared to 1993. Industry flight hours are expected to increase to increase 4.1 percent in 1995 to just over 3.1 million. During the 12-year forecast period, flight hours are forecast to increase at an average annual rate of 3.5 percent, and total over 4.5 million hours by 2006.

CHAPTER V

GENERAL AVIATION

CHAPTER V

GENERAL AVIATION

The term general aviation is used to describe a diverse range of aviation activities and includes all segments of the aviation industry except commercial air carriers (including commuter/ regional aircraft) and military. Its activities include the training of new pilots, sightseeing, the movement of large heavy loads by helicopter, and flying for corporate/business or personal reasons. Its aircraft range from a one-seat single engine piston to the long-range corporate jet.

General aviation is an important component of both the aviation industry and our national economy. It provides on-the-spot efficient and direct aviation services that commercial aviation cannot or will not provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance, and insurance, make the general aviation industry an important contributor to the nation's economy.

REVIEW OF 1994

On August 12, 1994, President Clinton signed the General Aviation Revitalization Act. The Act established an 18-year Statute of Repose on all general aviation aircraft and components. The enactment of the legislation represented the culmination of a lengthy industry campaign to revitalize the markets for general aviation products and services and to help restore a once-healthy industry.

AIRCRAFT SHIPMENTS AND BILLINGS

In fiscal year 1994, the number of general aviation aircraft shipments totaled 876, an increase of 4.9 percent over 1993. Billings were up 14.4 percent in 1994 to almost $2.3 billion. The increase in billings reflects the higher unit value of the aircraft being shipped.

Exports of general aviation aircraft totaled only 293 in 1994, a decline of 33.4 percent from 1993. Export billings declined 13.4 percent in 1994 to $829.7 million. Exports accounted for 32.2 percent of the total general aviation aircraft shipments and 36.4 percent of total billings in 1994.

The market for turbine powered general aviation aircraft increased for a third consecutive year in 1994. Turboprop aircraft shipments (221) were up 6.8 percent while shipments of jet aircraft (223) increased 29.7 percent.

Despite a continuation of the decline in the market for piston aircraft, it appears that the market may, in fact, be bottoming out. A total of 466 piston aircraft were shipped in 1994, a decline of only 1.3 percent from 1993.

PILOT POPULATION

As of January 1, 1994, the total pilot population was 665,069. This was 17,890 fewer pilots than a year earlier when the number of pilots totaled 682,959, a decline of 2.6 percent. The four major pilot grouping--student, private, commercial, and airline transport--totaled 647,367 and accounted for 97.3 percent of all pilots in 1994.

Of the four major groupings, only airline transport pilots (117,070) registered an increase in 1994, up 1.1 percent. The other three categories all showed declines in 1994--students pilots (103,583) declined 9.6 percent; private pilots (283,700) declined 1.5 percent; and commercial pilots (143,014) declined 2.3 percent.

The number of helicopter pilots also declined in 1994, down 5.0 percent to 9,168. However, the number of glider (8,328) and recreational (206) pilots both recorded increased numbers in 1994--up 1.5 and 10.2 percent, respectively.

After recording increased numbers for nine consecutive years, the number of instrument rated pilots declined slightly in 1994--down 0.2 percent to 305,517. Since 1984, however, this category of pilots is up 20.2 percent, an average annual increase of 1.9 percent. In 1994, 45.9 percent of all pilots were instrument rated, compared to 44.8 percent in 1993 and only 35.4 percent in 1984. These numbers reflect the increased sophistication of both the aircraft and pilots utilizing the National Airspace System.

OPERATIONS

General aviation activity at FAA towered airports declined for a fourth consecutive year in 1994, down 1.5 percent to 34.7 million operations. Most of the decline occurred in local operations (14.5 million), which were down 2.5 percent. Itinerant operations totaled 20.2 million in 1994, a decline of only 0.8 percent.

However, both general aviation instrument operations at FAA towered airports and the number of general aviation aircraft handled at FAA en route centers showed significant increases in 1994. Instrument operations (18.0 million) were up 1.5 percent while activity at en route centers (7.7 million) increased 3.3 percent. These increased levels of general aviation activity by the more sophisticated aircraft, combined with increased shipments of turboprop and turbojet aircraft, could indicate the long awaited upturn in business/corporate flying.

1993 GENERAL AVIATION ACTIVITY SURVEY

The historical general aviation active fleet and hours flown discussed in this chapter are derived from the General Aviation Activity Survey that is conducted annually by the FAA's Statistics and Forecast Branch. The fleet data are estimated using a sample from the FAA aircraft registry and are subject to variation due to errors in the registry and statistical sampling variability.

A top-to-bottom review of the survey resulted in several changes which cause some discontinuities in the historical series beginning in 1993. First, commuter aircraft were excluded from the

1993 survey for the first time. Second, two new use categories were added--Sight-Seeing and External Load. Most of the sightseeing activity was included in the Aerial Observation category in prior years. The external load activity was previously included in the Other Work category.

Several new aircraft type categories were also added to the 1993 survey. Single-engine turboprop aircraft were separated from the "other" turboprop category. Turbine rotorcraft, formerly a separate category, was divided into single-engine and multi-engine. Additionally, all aircraft with the experimental airworthiness certificates were grouped together. Prior to 1993, these aircraft had been included within the other aircraft groupings.

The revised active fleet and hours flown, by aircraft type and use category for the period 1989 to 1993, are detailed in Appendix F.

The 1993 survey results for active general aviation aircraft are reported as January 1, 1994 totals in Tables 21 and 22 (Chapter IX). The 1993 survey results for hours flown are listed in Table 23 (Chapter IX) as reported in the 1993 survey--as calendar year 1993. Prior to this year, general aviation hours flown had been converted to a fiscal year basis by combining the hours flown from two survey years (e.g., one quarter of 1991 hours plus three quarters of 1992 hours equaled fiscal year 1992). All historical and forecast hours flown data are now reported on a calendar year basis.

ACTIVE AIRCRAFT

The "active fleet" consists of any aircraft flown at least one hour during the previous year. Based on the results of the 1993 survey (reported as 1994 in Tables 21 and 22), the general aviation active fleet totaled 176,006. This represents a 4.6 percent decline from the revised count of 184,434 active aircraft in 1992.

All general aviation aircraft categories recorded declines in 1993. The number of single engine piston aircraft declined from 143,580 to 130,687 (9.0 percent); multi-engine piston aircraft declined from 18,537 to 16,406 (11.5 percent); turboprop aircraft declined from 4,704 to 4,359 (7.3 percent); turbojet aircraft declined from 4,022 to 3,859 (4.1 percent); and rotorcraft declined from 5,753 to 4,510 (8.6 percent). The "other category", gliders and lighter-than-air aircraft--blimps, dirigibles, and balloons, declined 30.6 percent in 1993, from 7,563 to 5,247 aircraft.

A new aircraft category was created from the 1993 survey data--experimental aircraft. The number of experimental aircraft totaled 10,938 and consisted of three sub-categories--home builts (6,854), exhibition (1,622), and other (2,462).

HOURS FLOWN

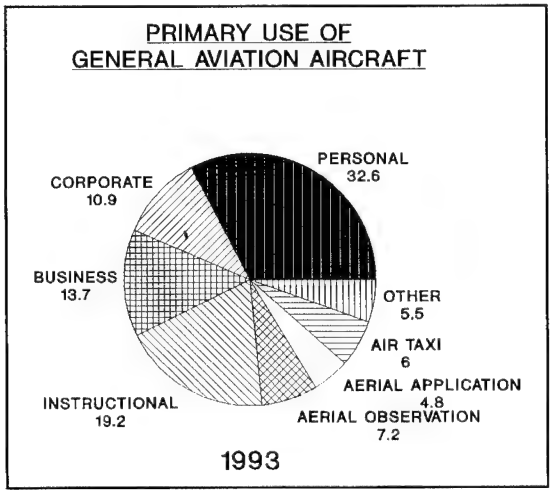
In 1993, the number of general aviation hours flown totaled 24.3 million. This represents a decline of 5.7 percent from the revised 25.8 million hours flown in 1992. Declines were registered in three aircraft categories in 1993--single engine pistons (16.5 million), down 8.3 percent; multi-engine pistons (2.5 million), down 13.8 percent; and rotorcraft (1.8 million), down 18.2 percent. The hours flown by turboprop (1.2 million) and "other" aircraft (0.4 million) remained unchanged from 1992. Turbojet aircraft hours flown were up 9.1 percent in 1993, totaling 1.2 million.

A total of 710,626 hours flown was recorded for the new experimental aircraft category in 1993. This consisted of 298,339 hours for home

builts, 87,679 hours for experimental-exhibition aircraft, and 324,608 hours for all other experimental aircraft.

PRIMARY USE OF AIRCRAFT

Based on the number of hours flown, personal use continues to be the major reason given for general aviation activity. In 1993, personal flying (7.7 million hours) accounted for 32.6 percent of general aviation



activity, down from 33.3 percent in 1992. The second largest use category, instructional flying (4.7 million hours) declined from 20.7 percent in 1992 to 19.2 percent in 1993.

The number of hours flown by the combined use categories of business and corporate flying increased 3.5 percent in 1993, from 5.8 to 6.0 million. These two use categories accounted for 24.6 percent of total general aviation activity in 1993, up from 21.5 percent in 1992. Although the total hours recorded for the business use category declined from 3.5 to 3.3 million, its percentage of total activity remained constant at 13.7 percent. The hours recorded for the corporate use category increased from 2.3 to 2.7 million in 1993, an increase of 17.6 percent. Corporate flying accounted for 10.9 percent of general aviation activity in 1993, up from 8.8 percent in 1992.

A NEW BEGINNING

General aviation continues to be a dominant force in aviation. In 1993, there were 670 airports with commercial service certificates (also used by general aviation) and a total of 17,647 airports/heliports used exclusively by general aviation aircraft. In terms of active aircraft, there were a total of 176,006 active general aviation aircraft in 1994--compared to 4,426 commercial jet aircraft, 2,179 regional/commuter aircraft, and 16,000 military aircraft.

Of the 665,069 certificated pilots in 1994, general aviation accounted for over 82 percent of the total. In 1993, general aviation operations totaled 98.4 million, over 74 percent of the total 132.8 million operations at U.S. airports, both towered and nontowered.

THE DECLINE IN MANUFACTURING

Despite its dominance, general aviation has been in a state of decline throughout most of 1980s and the early 1990s. Nowhere is the decline most evident--and, perhaps most critical--than in the U.S. general aviation manufacturing industry. In 1980, there were 29 U.S. and 15 foreign manufacturers of piston aircraft. Today, there are 29 foreign and only nine U.S. manufacturers. In 1980, 100 percent of the single engine pistons sold in the United States were manufactured in the United States. Today, less than 70 percent are manufactured in the United States.

The continuing decline in the number of

manufacturers and shipments of the single engine piston aircraft is one of the major causes for concern in the industry. The single engine piston aircraft is the base on which general aviation must build its future. Historically, new pilots are trained in single engine piston aircraft and work their way up through retractable landing gear and multi-engine piston to turbine aircraft. When the single engine piston market is in decline, it signals a slowing of expansion in the general aviation fleet and, consequently, a slowing in the rate of growth of general aviation activity.

Events that have contributed to the downturn in general aviation activity include changes in disposable income; increases in airspace restrictions applied to VFR aircraft; reductions in leisure time; shifts in personal preferences for goods, services, and leisure time; and the deregulation of the commercial airline industry.

However, one of the factors that is mentioned most frequently as the cause of the decline in general aviation is the increased cost of owning and operating a general aviation aircraft.

OWNERSHIP COST FACTORS

The cost of owning (maintaining and operating) all classes of general aviation aircraft has been steadily increasing. Although the total nominal cost of owning and operating an aircraft has increased between 4.0 and 4.3 percent annually since 1978, these costs have largely been inflationary and compare favorably to increases in the consumer price index over the same period. In fact, the real cost (1982-84$) of maintaining and operating a general aviation aircraft has actually declined since the early 1980s.

In contrast, the nominal cost of purchasing a general aviation aircraft has risen dramatically, far exceeding the rise in inflation. Since 1978, the average cost of purchasing general aviation aircraft has increased as follows:

- single engine piston aircraft are up 126 percent through 1986 (the last year of production of this type of aircraft), 30.6 percent in 1982-1984$;
- multi-engine piston aircraft are up 238 percent, 52.2 percent in 1982-1984$;
- turboprop aircraft are up 209 percent, 38.8 percent in 1982-1984$; and
- turbojet aircraft are up 195 percent, 32.9 percent in 1982-1984$.

Despite relatively low inflation over the past 3 years (up a cumulative 7.3 percent), the nominal purchase prices of multi-engine pistons (up 15.3 percent), turboprops (up 14.9 percent), and turbojets (up 24.4 percent) have increased significantly.

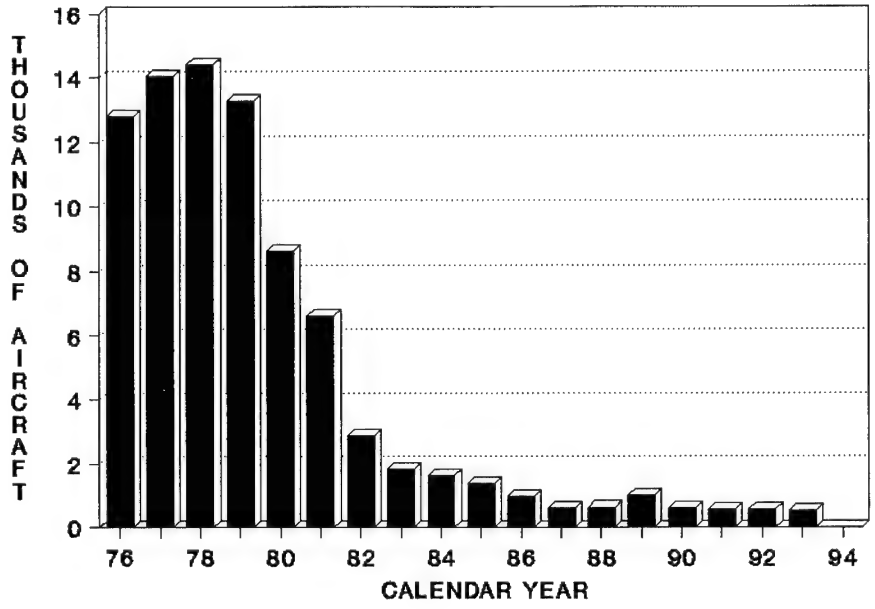
Increases in product liability costs are one of the key factors responsible for the large increases in the purchase price of a general aviation aircraft. Over the last 10 years, annual claims paid by manufacturers have increased from $24 million to over $210 million, despite an improved safety record.

Clearly, these ownership cost increases, especially those in the purchase price, have a negative impact on general aviation and are, in large part, responsible for the decline in aircraft shipments over the last several years.

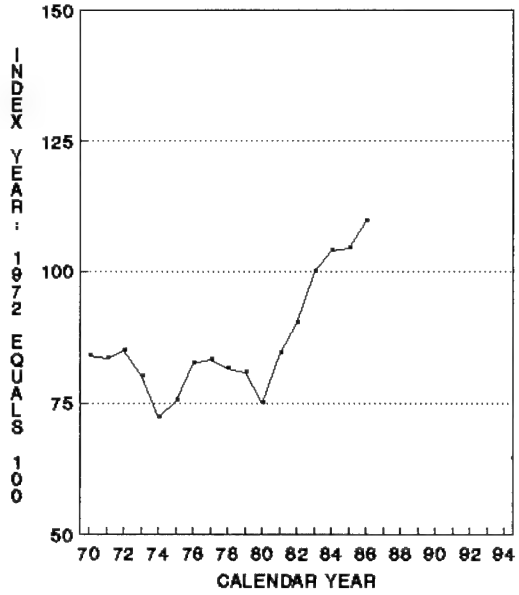
The tables in Appendix G and the graphs on the following four pages depict the real cost of purchasing and maintaining/operating a general aviation aircraft. Nominal or current purchase prices and operating costs have been

SINGLE ENGINE PISTON AIRCRAFT TRENDS

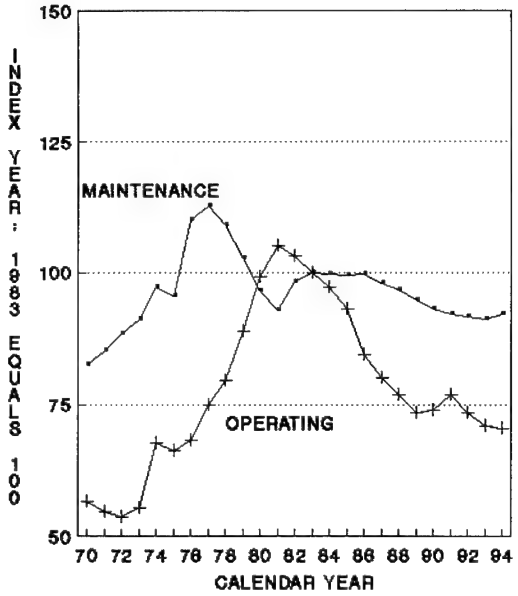
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)

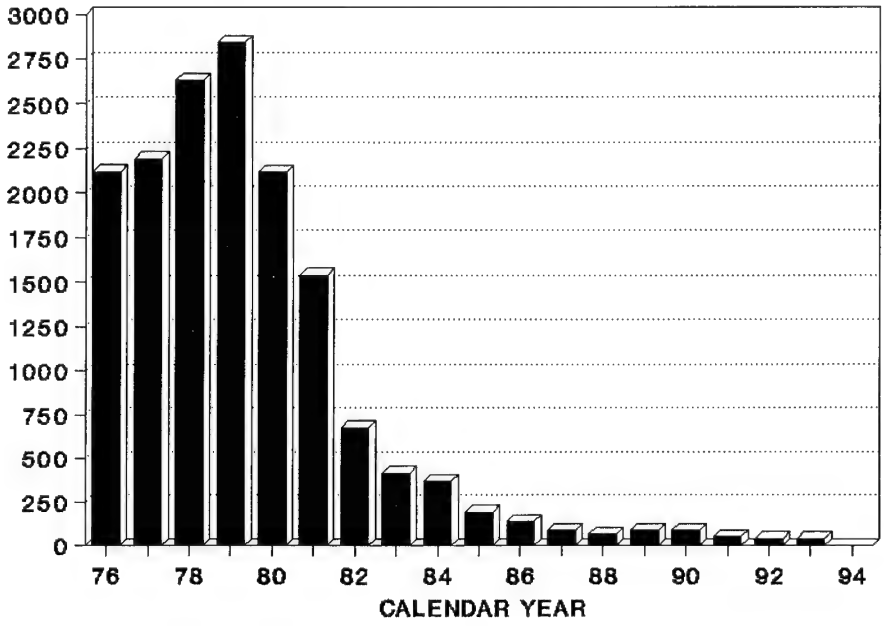


OPERATING AND MAINTENANCE COSTS ($1983)

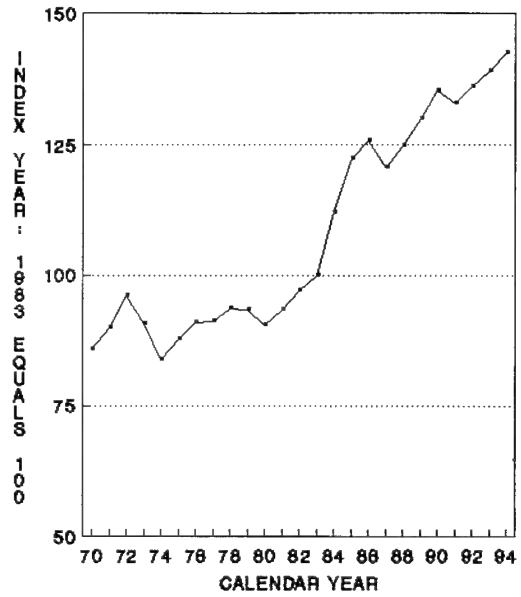


MULTI-ENGINE PISTON AIRCRAFT TRENDS

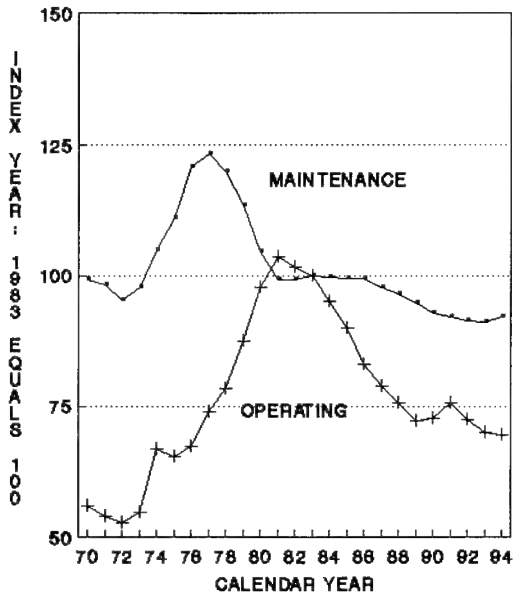
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)

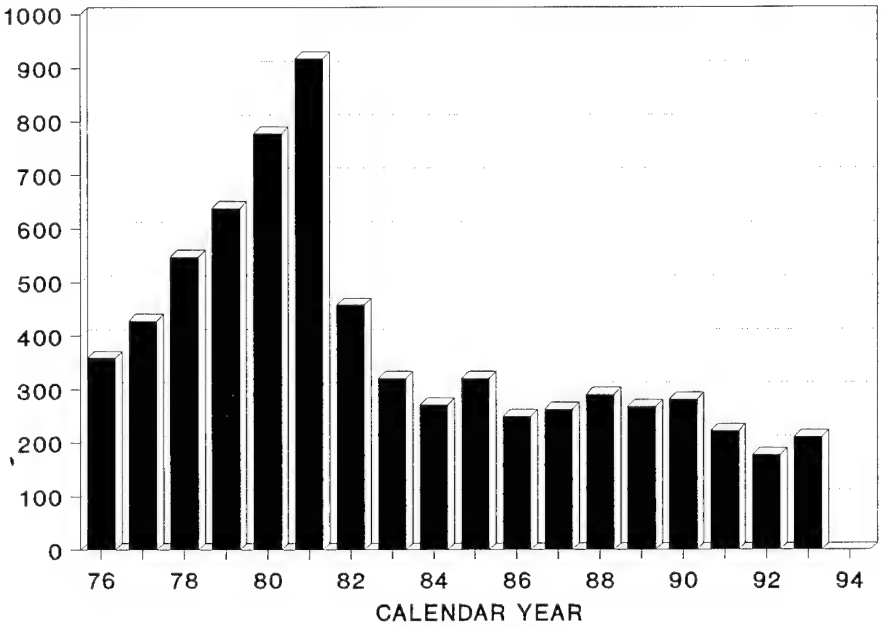


OPERATING AND MAINTENANCE COSTS ($1983)



TURBOPROP AIRCRAFT TRENDS

AIRCRAFT SHIPMENTS



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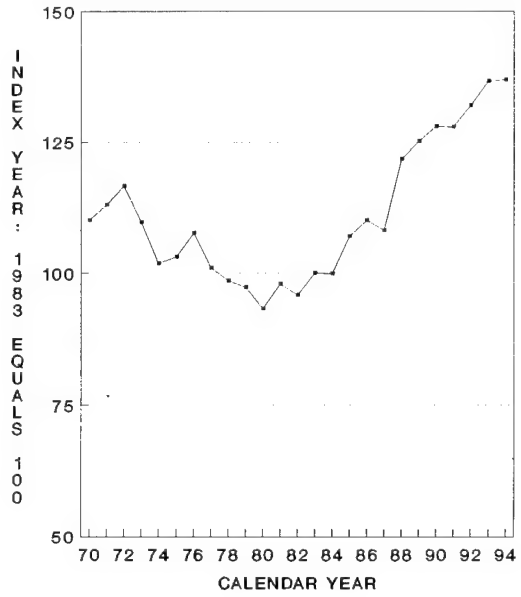

OPERATING AND MAINTENANCE COSTS
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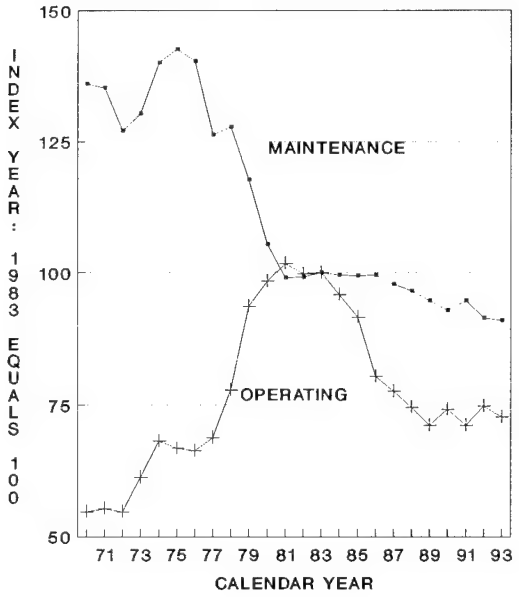
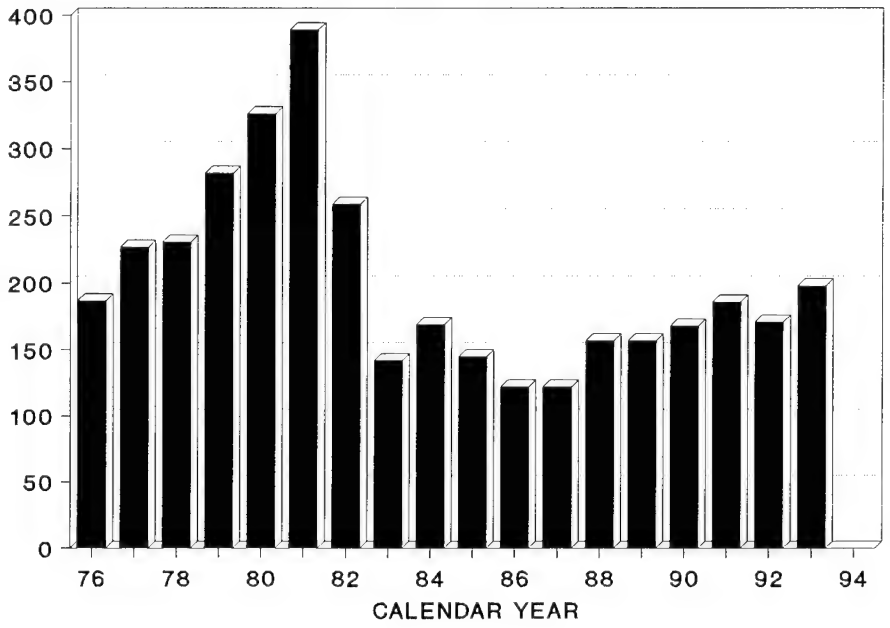


TURBOJET AIRCRAFT TRENDS

AIRCRAFT SHIPMENTS



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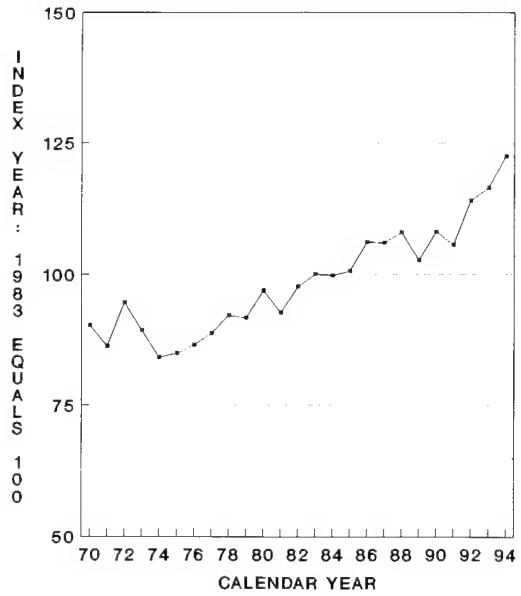
($1983)



OPERATING AND MAINTENANCE COSTS
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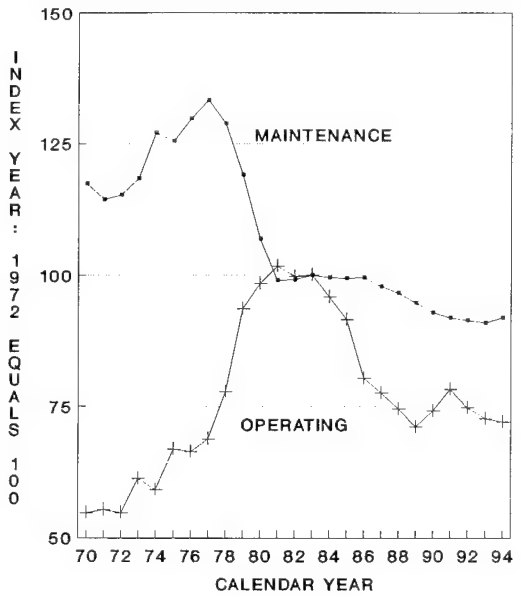


deflated by the consumer price index (an average of 1982-1984$) and indexed to 1983 (i.e., 1983 = 100).

REASONS FOR OPTIMISM

There are a number of reasons for guarded optimism in the general aviation industry. A number of ongoing events suggest that general aviation may experience a renaissance. There is, in fact, a growing realization in the aviation community that general aviation must "reinvent" itself and create a new demand/growth curve.

One of the main reasons for this optimism is the recent passage of the General Aviation Revitalization Act, which limits the liability on general aviation aircraft to 18 years from the date of manufacture. This legislation is expected to enable general aviation aircraft manufacturers to lower their insurance costs. More importantly, it would enable manufacturers to begin to design and produce new technology and less expensive general aviation aircraft.

Additionally, the amateur-built aircraft market has shown steady growth over the last several years. Almost 1,000 new amateur-built experimental aircraft received airworthiness certificates and over 2,000 kits are sold annually by the 14 major kit manufacturers.

The used aircraft market has also remained strong during the past several years with almost 36,000 aircraft changing hands in 1992. Additionally, prices for piston aircraft have also remained strong, thus reflecting some pent-up demand for these aircraft. The success of the kits and the strength of the used aircraft market show the creativity and resilience that still exist in the market.

The international use of general aviation aircraft has increased during the past several years. Based on sample flight-strip data obtained from the North Atlantic oceanic centres, weekly operations of general aviation aircraft increased from 119 in 1983 to 338 in 1991, 293 in 1992, and 396 in 1993. Some of the increased activity during the 1990s is, no doubt, the result the of concerns of business for the safety and security of its traveling employees. However, a large part of it is also the result of business adapting to meet expanding global markets and opportunities. The new Gulfstream 5, capable of flying 7,500 miles nonstop, will help meet this new demand.

Although total general aviation activity at FAA towered airports has declined substantially since 1978, general aviation instrument operations at FAA towered airports have actually increased 9.1 percent since that time. Additionally, the number of general aviation aircraft handled at en route centers increased 3.3 percent in 1994. These two statistics point to continued growth among the more sophisticated general aviation users using the National Airspace System.

In addition, general aviation operations at nontowered airports are up 6.8 percent since 1978. This lends some credence to those who contend that much of general aviation has, because of increased commercial air carrier activity, been forced out of many towered airports. This also support the results of the General Aviation Activity Survey, which shows that personal flying has increased as a percentage of total general aviation activity--from 27.2 percent in 1985 to 32.6 percent in 1993.

FAA Programs/Initiatives

There is the growing climate of partnership between the FAA and the

general aviation community. The FAA recently streamlined its certification process for new entry-level aircraft (Primary Category Rule) and this could also increase the production of new small, affordable aircraft.

Another example of cooperation is that 11 general aviation organizations have formed the General Aviation Action Plan Coalition to support implementation of the FAA's "General Aviation Action Plan."

The "General Aviation Action Plan" is based on four principles associated with the President's "reinventing" Government program. These principles include cutting red tape, putting the customer first, empowering employees, and getting back to basics. Within this framework, the Plan sets forth five goals relating to general aviation safety, provision of FAA services to general aviation, general aviation product innovation and competitiveness, system access and capacity, and affordability.

At the risk of over simplification, the goals of the Plan seek to provide for:

- (1) Regulatory relief and reduced user costs achieved through reduced rules and processes and the implementation of a general aviation parts policy that is consistent with maintaining or increasing safety.

- (2) Improved delivery of FAA services achieved by reducing excess layers of management, decentralization of the decision-making process, and giving the general aviation customers a voice in the development of FAA programs and how services are delivered.

- (3) Lastly, the elimination of unneeded programs and processes, and investment of FAA resources in those programs that provide the greatest government productivity and responsiveness to its customers' needs.

There is also a growing effort to unlock general aviation's transportation potential through product innovation. In this area, the FAA and the National Aeronautics and Space Administration (NASA) have collaborated with the general aviation community to implement a research program to bring new technologies to general aviation.

The FAA has spent considerable effort cooperating with the aviation authorities in Russia, China, and elsewhere to develop common aviation standards. These initiatives, combined with efforts by industry, could tap vast new markets for general aviation products in places where general aviation does not currently exist.

Manufacturer and Industry Programs/Initiatives

Manufacturer and industry programs/ initiatives include the "No Plane No Gain" campaign sponsored jointly by the General Aviation Manufacturers Association and The National Business Aircraft Association; the Aircraft Owners and Pilots Association's (AOPA) "Project Pilot"; and the National Air Transportation Association's (NATA) "Learn to Fly" program.

The "No Plane No Gain" program is directed at the business community, and is designed to promote the use of general aviation aircraft as an essential tool of business. The thrust of the effort is to show that companies which use GA aircraft in the performance of their day-to-day business are well managed, more efficient, and more profitable than those that do not. The program uses videos, speakers kits, slide shows, and advocacy materials for distribution among the business community to highlight the benefits of general aviation to business, and to

the bottom line of the company's balance sheet.

"Project Pilot" and "Learn to Fly" are programs directed at individuals, and are designed to promote the growth in the number of new student starts and general aviation flying.

AOPA's Project Pilot encourages its members to identify individuals that would benefit from special encouragement and assistance in the pursuit of becoming a private pilot. The sponsoring AOPA member then serves as a mentor to the student, offering support and assistance to the student during his or her training. AOPA members/mentors are provided with materials designed to help them to identify students who would benefit form the program. The participating students are also introduced to the program through a special program kit which includes such items as a video on the joy of flying, decals, a special issue of Pilot Magazine, and AOPA membership information.

The mission of NATA's "Learn to Fly" campaign is to increase the number of active GA pilots by increasing the number of student starts and by motivating inactive pilots to return to active flying. The program is a targeted effort designed to promote the benefits of learning to fly. It is designed to stimulate the interest of the targeted audience through advertising and promotional efforts. In addition, it provides interested prospects with fast and easy access to information on how to go about learning to fly. This is accomplished through the use of a toll free telephone number--(800)-I-CAN-FLY, information packets provided through direct mail response resulting form telephone inquiries, and follow-up calls by participating flight schools in the interested callers zip code area.

Beyond the goal of bringing new pilots into general aviation, both "Project Pilot" and the "Learn to Fly" programs are also interested in rekindling the desire to fly of students who have abandoned their training by encouraging them to complete their certification, as well as to convince licensed pilots who stopped flying to return to active status.

Another program that may stimulate new interest in learning to fly is the "Young Eagles" program sponsored by the Experimental Aircraft Association. This program involves taking young people ages 12 to 14 up on their first flight in a small aircraft. This not only exposes them to their first flight in a small aircraft but could spark an interest in their learning to fly.

Additionally, with the passage of the Statute of Repose legislation, Cessna has committed to resume production of selected single engine piston aircraft models, the 172, 182, and 206. These aircraft are expected to be in production by the end of 1996 at a new 500,000 square foot final assembly plant to be built in Independence, Kansas. It is estimated that the facility will generate 1,000 new jobs. When the first new aircraft is rolled out, it will be the first new single engine piston Cessna has produced since 1986.

In addition to Cessna resuming production, Piper Aircraft has announced plans to increase its production level and hire new workers. Several new small aircraft models have been successfully introduced and show promise for the future; i.e., the Diamond Katama, a two-seat trainer.

GENERAL AVIATION FORECASTS

The general aviation forecasts discussed in the following paragraphs are based on a set of assumptions, not the

least of which is the outlook for moderate and sustained growth in the U.S. economy. The forecasts also assume that recently enacted legislation limiting the liability of manufacturers of general aviation aircraft will begin beneficially affecting the general aviation fleet in the 1997-99 time frame. Growth in general aviation activity will, to some degree, be driven by an expanding U.S. economy. However, whether the predicted recovery in general aviation actually materializes will depend, to a large extent, on the response of general aviation manufacturers to this historic legislation. If the legislation fails to stimulate the development and production of new general aviation products and services, both the active fleet and hours flown forecasts will be considerably lower than currently forecast.

ACTIVE FLEET

The active general aviation aircraft fleet is expected to decline slightly (down 0.3 percent annually) during the 12-year forecast period, with all of the decline occurring in the early years (1995-98). The decline in the total active fleet is driven primarily by retirements in the piston engine fleet.

The number of single engine aircraft is projected to decline from 130,687 aircraft in 1994 to 122,400 aircraft in 1998, and to remain at that level throughout the remaining eight years of the forecast period. The decline is due in large part to the expected large numbers of retirements and/or shifts to nonactive status of many of the older aircraft in the single engine piston fleet. The retirement of these older aircraft is expected to continue to occur throughout the forecast period. However, after 1998, older piston aircraft retired from the fleet may be replaced by newer technology aircraft that are, in part, a response to the passage of the General Aviation Revitalization Act.

Multi-engine piston aircraft are also expected to decline in absolute numbers during the early years of the forecast period, from 16,406 in 1994 to 15,600 in 1998. This decline is due to retirements of many of the older multi-engine piston aircraft. However, the multi-engine piston fleet is expected to increase slightly during the remaining years of the forecast period (to 16,000 in 2000) as purchases of new technology aircraft outpace retirements.

The active turbine-powered fleet is expected to grow throughout the forecast period (2.5 percent annually), largely the result of an expanding U.S. economy. The number of turboprop aircraft grows from 4,359 in 1994 to 5,800 in 2006. Turbojet aircraft increase from 3,859 in 1994 to 5,300 in 2006.

The rotorcraft fleet is forecast to increase at an annual rate of 1.8 percent over the forecast period. All of this growth, however, occurs in the turbine fleet, which increases from 2,864 in 1994 to 4,100 in 2006. Piston-powered rotorcraft are expected to decline from 1,646 to 1,500 over the same time period.

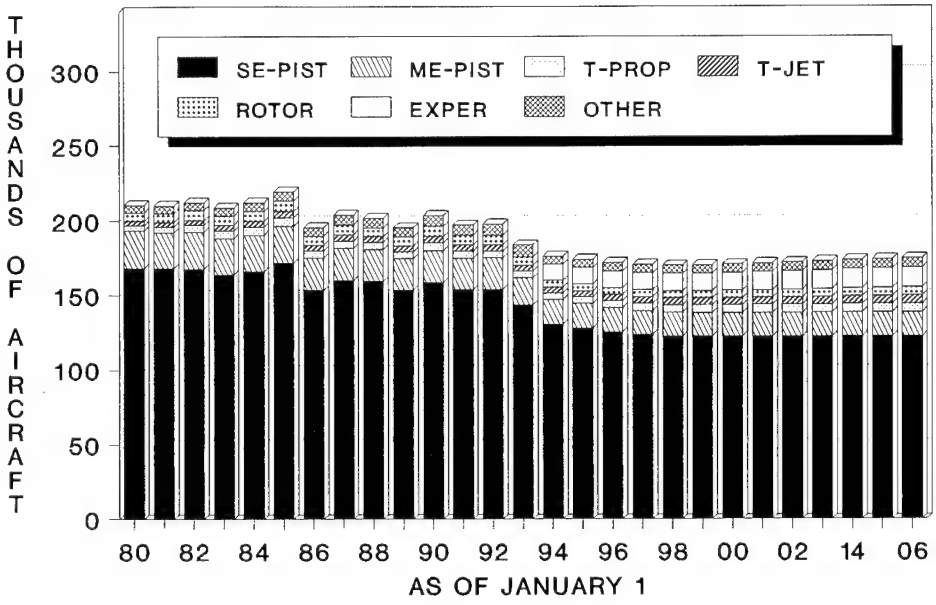
Gliders and lighter-than-air aircraft are forecast to increase by 1.7 percent annually, growing from 5,247 in 1994 to 6,400 aircraft in 2006.

Experimental aircraft, which is forecast as a separate category for the first time in this document, is expected to increase from 10,938 in 1994 to 13,100 in 2006.

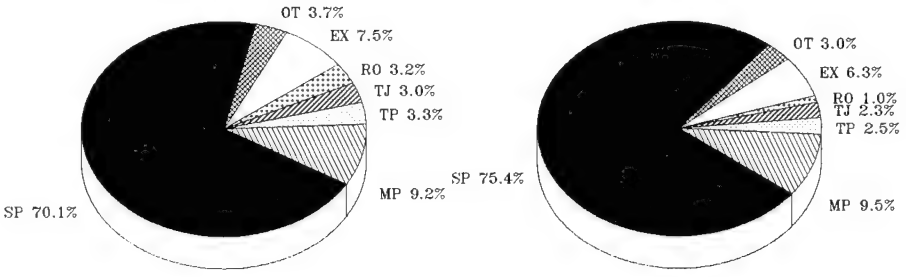
AIRCRAFT UTILIZATION

For years it has been assumed that the aging of the general aviation fleet was one of the main determinants of de-

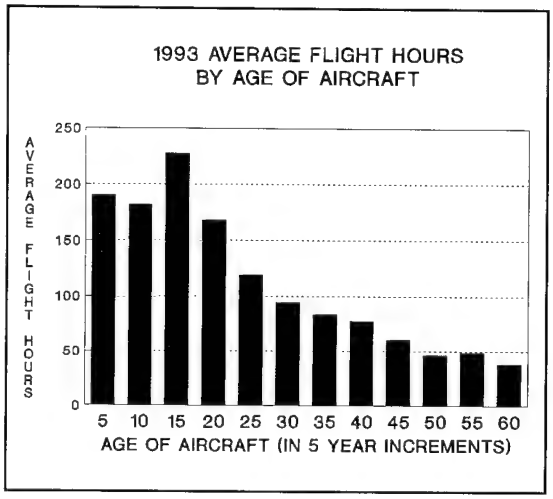
ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT



PERCENT BY AIRCRAFT TYPE



1994 2006



clining utilization among general aviation aircraft. It is estimated that the average age of the general aviation fleet was 27 years in 1993, with piston aircraft accounting for the majority of the aging fleet. Data from the 1993 survey showed that aircraft utilization peaks at 227 hours between 11 and 15 years and then declines gradually thereafter. The aging of the fleet is certainly one of the main causes of declining utilization among general aviation aircraft.

During the 1990-93 time period, the average number of hours flown by general aviation aircraft declined significantly. Part of the decline can be attributed to the aging of the general aviation fleet; however, an equally large part is assumed to be the result of the U.S. economic slowdown/ recession in 1990-91 and slow recovery in 1992. While there was an large increase in utilization in 1994, it is unclear as to how much of the increase was the result of the strong U.S. economy in 1994, and how much was due to the fact that experimental (65 hours per aircraft) were separated from the other aircraft categories in this year.

Between 1993 and 1994, the average number of hours flown by single and multi-engine piston aircraft increased by 7.4 and 11.1 percent, respectively. Turboprop and turbojet utilization also increased during the same period, up 3.8 and 1.9 percent, respectively.

Based on economic assumptions that forecast moderate and sustained growth throughout the 12-year forecast period, it has been assumed that the average hours flown per aircraft will gradually return to utilization levels achieved prior to the economic downturn during the 1990s.

Single engine piston aircraft utilization is forecast to increase from 123.7 hours in 1994 to 134.0 in 1999, then gradually decline to 127.7 hours in 2006. Multi-engine piston aircraft utilization is forecast to increase gradually (1.4 percent annually) over the forecast period, from 153.3 hours in 1994 to 180.9 hours in 2006.

The average hours flown by turbine-powered aircraft is forecast to increase at an average annual rate of 1.9 percent annually over the forecast period. Turboprop aircraft utilization increases from 281.4 hours in 1994 to 351.8 hours in 2006. Turbojet hours grow from 302.0 to 380.5 during the same time period.

Rotorcraft fleet utilization also increases over the forecast period--piston rotorcraft from 224.8 hours to 256.3 hours (1.1 percent annually) and turbine rotorcraft from 510.5 hours to 597.3 hours (1.3 percent annually).

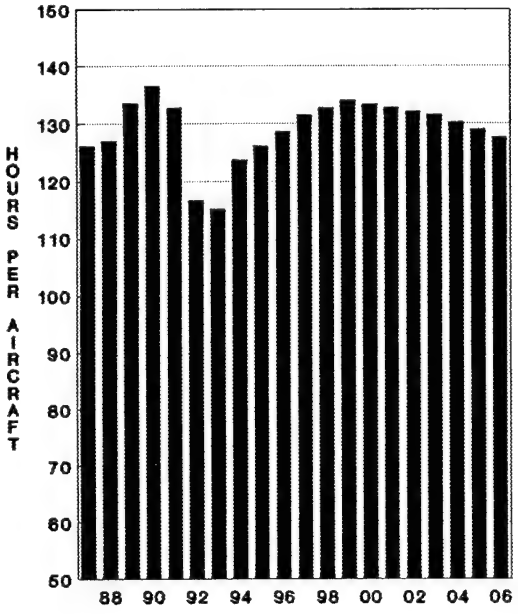
The average hours flown by experimental aircraft is forecast to increase from 65 hours in 1994 to 72.8 hours by 2006, an average annual increase of 1.0 percent.

HOURS FLOWN

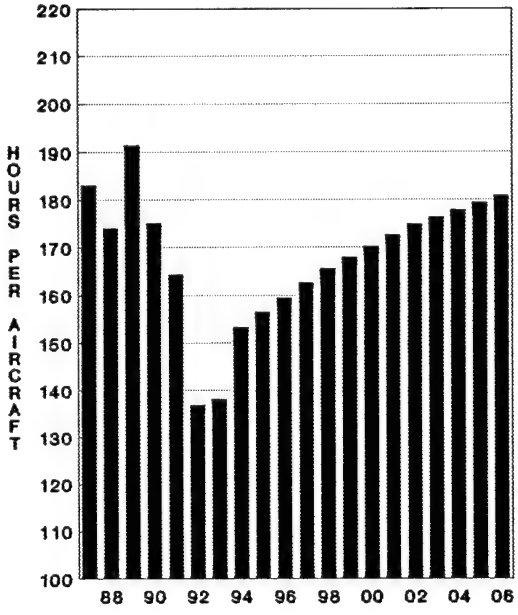
Although the active general aviation fleet is expected to decline slightly over the forecast period, the projected increases in aircraft utilization result in an increase in the number of hours flown by general aviation aircraft. General aviation hours flown are projected to increase at an average

GENERAL AVIATION AIRCRAFT UTILIZATION

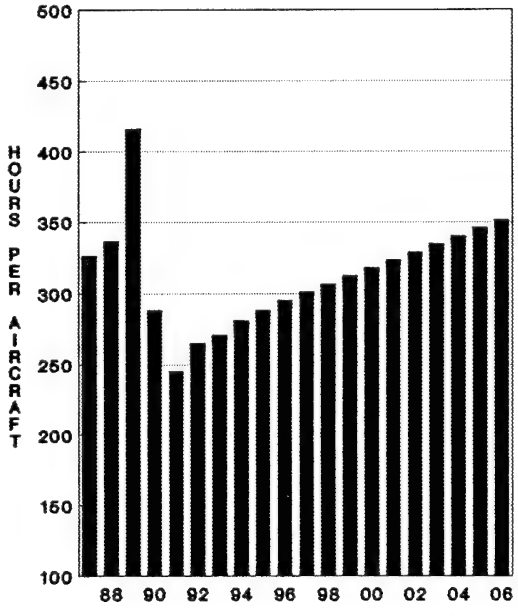
SINGLE ENGINE PISTON



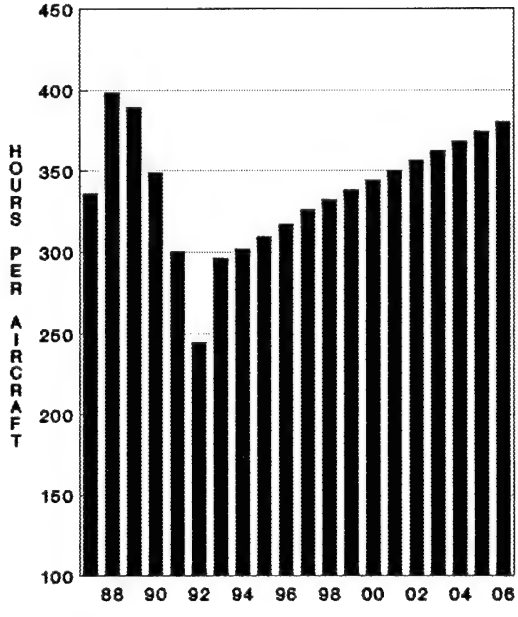
MULTI-ENGINE PISTON



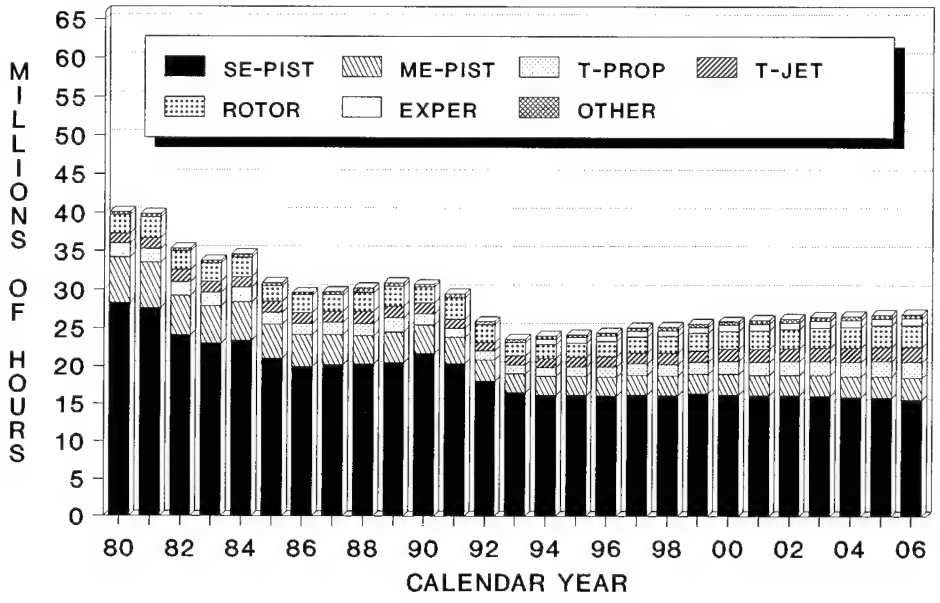
TURBOPROPS



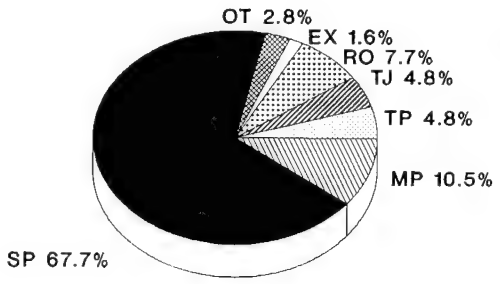
TURBOJETS



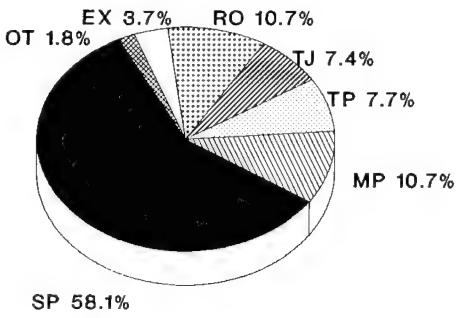
ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



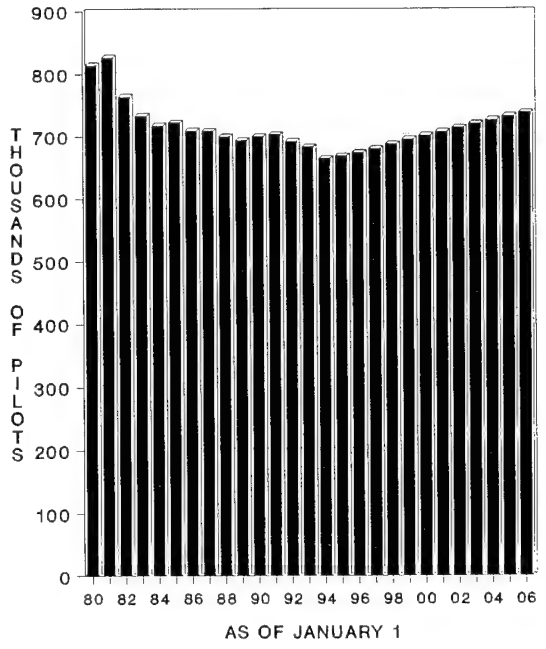
1994



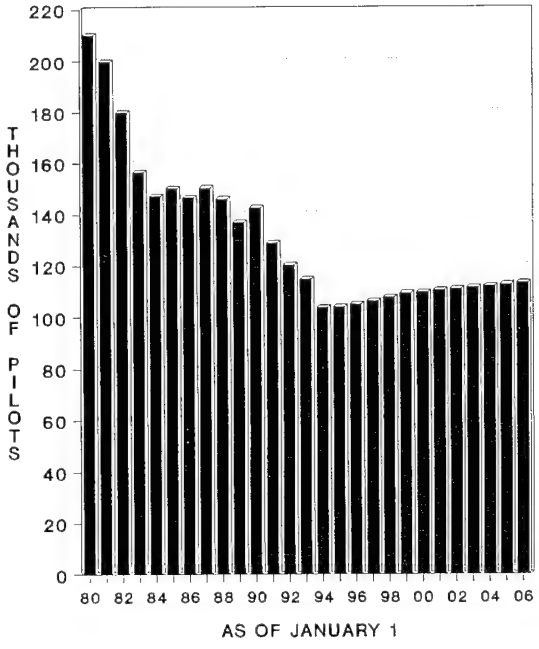
2006

ACTIVE PILOT TRENDS AND FORECASTS

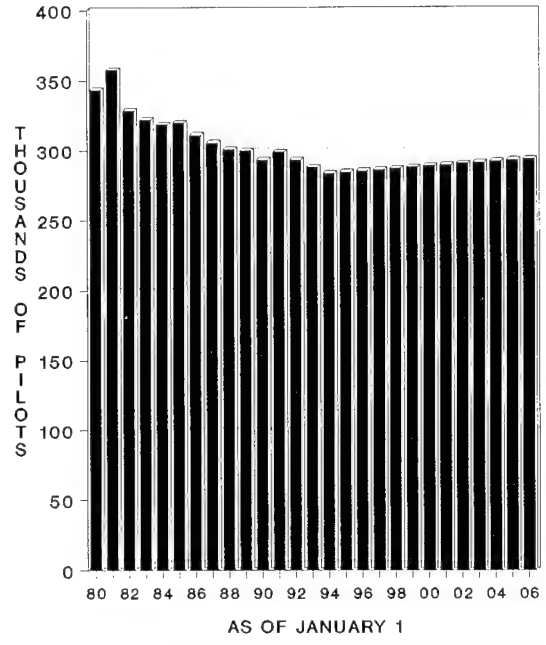
TOTAL PILOTS



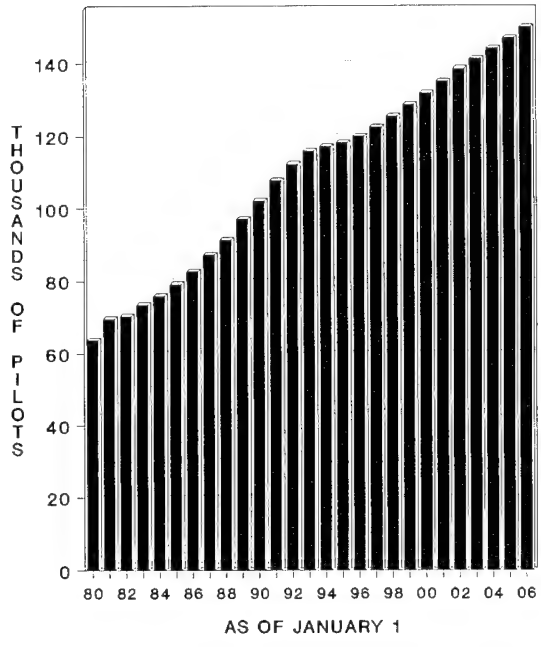
STUDENT PILOTS



PRIVATE PILOTS



AIRLINE TRANSPORT PILOTS



annual rate of 1.0 percent over the next 12 years, reaching 27.0 million hours in 2006.

Single engine piston aircraft hours flown are forecast to decrease from 16.2 million in 1994 to 15.6 million in 2006, an annual rate of decline of 0.3 percent. Multi-engine piston aircraft hours are expected to increase from 2.5 million in 1994 to 2.9 million in 2006, a rate of 1.3 percent annually.

Turbine-powered aircraft hours flown are projected to increase from 2.4 million in 1994 to 4.1 million in 2006, an annual growth rate of 4.5 percent. Rotorcraft hours flown are expected to increase at an annual rate of 1.8 percent over the same time period, from 4.5 to 5.6 million.

Experimental aircraft hours flown are forecast to increase from 10.9 million in 1994 to 13.1 million in 2006, an annual growth rate of 1.5 percent. Hours flown by gliders and lighter-than-air aircraft are projected to increase by 1.7 percent annually, from 5.2 to 6.4 million over the 12-year forecast period.

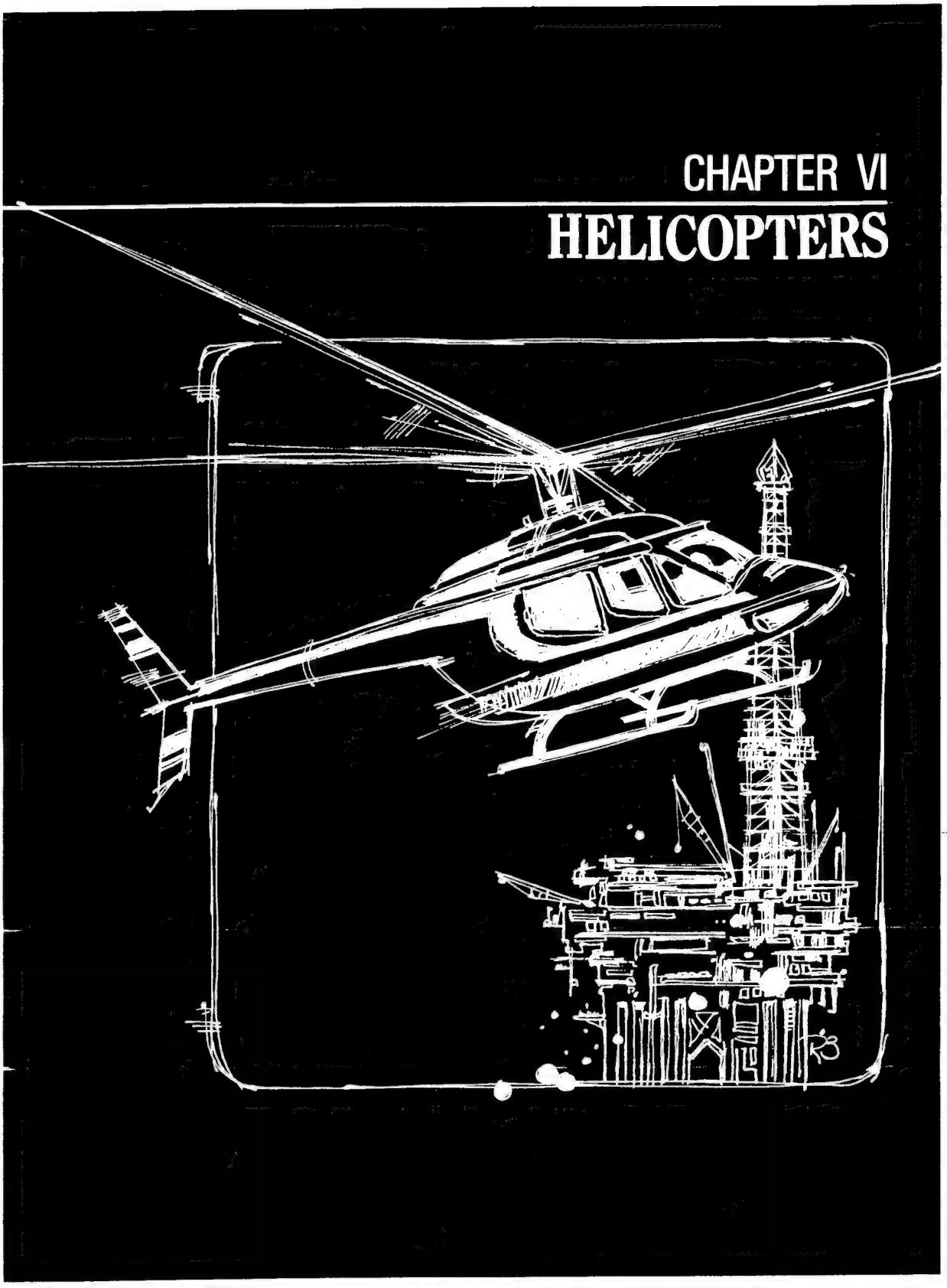
PILOT POPULATION

The total pilot population is projected to increase to a total of 738,300 by 2006, a 0.9 percent annual growth rate. The number of student and recreational pilots is forecast to increase by 0.9 percent annually over the forecast period, from 103,789 in 1994 to 114,100 in 2006. While much of this growth is in response to U.S. economic growth, it also assumes some growth in general aviation pilot training and flight schools which, in turn, implies future growth in the industry.

The projected growth for selected pilot categories include: private pilots, 0.3 percent annually; commercial pilots, 1.0 percent annually; and airline transport pilots, 2.1 percent annually.

The number of instrument rated pilots is expected to increase from 305,517 in 1994 to 354,300 in 2006, a 1.3 percent annual rate of growth. In 1994, 45.9 percent of all pilots were instrument rated. By 2006, the percentage of instrument rated pilots is projected to increase to 48.0 percent. This implies continued increases in the sophistication of the aircraft and pilots using the National Airspace System.

CHAPTER VI
HELICOPTERS



CHAPTER VI

HELICOPTERS

Helicopters participate in a wide and diverse range of aviation activity. Their activities include sight-seeing, crop dusting, fire fighting, personal transportation, emergency medical services, transporting personnel and supplies to off-shore oil rigs, traffic reporting, corporate or business transportation, and the lifting of heavy loads. All of these activities are important, contributing to the nation's economy.

1993 GENERAL AVIATION ACTIVITY SURVEY

The fleet and hours flown data are derived from the annual General Aviation/Air Taxi Activity and Avionics Survey. This survey is a stratified random sample of all U. S. general aviation and air taxi aircraft registered with the FAA. As discussed in the preceding chapter, a "top-to-bottom" review of the survey resulted in several changes to the 1993 survey which caused some discontinuities in the historical data series; thus, making comparison to prior years' data inappropriate. Commuter aircraft were excluded from the survey and two new use categories--Sight-seeing and External Load--were added.

Several new aircraft type categories were also added. The turbine powered rotorcraft were divided into single and multi-engine. Prior to 1993, aircraft with an experimental airworthiness certificate were not separated from the other aircraft. For example, amateur built gyrocopters were included in the rotorcraft estimates. Beginning with the 1993 survey, the experimental aircraft were grouped together and excluded from the other aircraft types. The experimental aircraft are about 20 percent of the rotorcraft fleet and the elimination of these aircraft had a significant impact on the activity estimates. This caused the population of rotorcraft to decrease and a subsequent decrease in the number of active aircraft and flight hours.

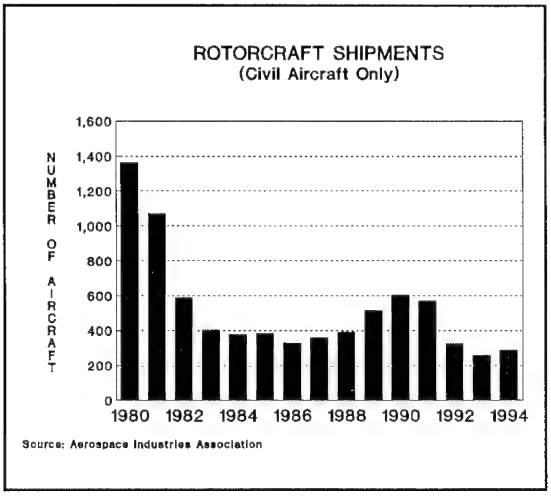
Rotorcraft active fleet and flight hours data by type and by use category for the period 1989 to 1993 are shown in Appendix F.

REVIEW OF 1994

SHIPMENTS

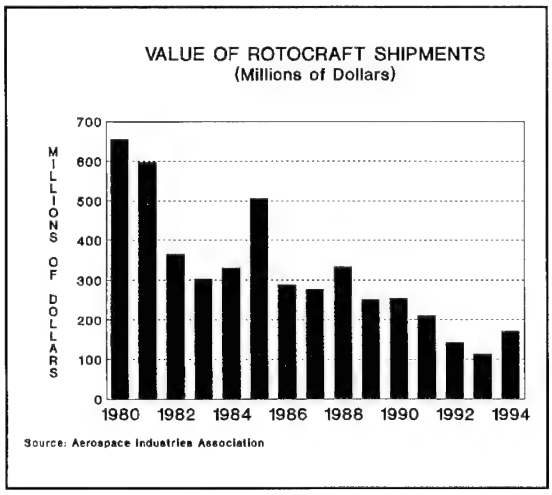
Preliminary data for calendar year 1994 indicate that shipments of new U.S.

civil helicopters will total 288 units. Compared to the 258 units shipped in 1993, this represents an increase of



11.6 percent. However, when compared to the 1,366 units shipped in 1980, it shows that the market for civil helicopters has declined by nearly 80 percent.

The value of the hecicopter shipments totaled $171 million in 1994. This represents an increase of 51.3 percent compared to billings of $113 million in



1993. Most of the increase is derived from the sale of light single and twin engine helicopters--the types that serve the corporate and Emergency Medical Service (EMS) markets. While this increase does not yet confirm a sustained upward trend, the data does suggest that the market for helicopters may have bottomed out in 1992 - 1993.

Indeed, in the Aerospace Industries Association's 1994 Year-End Review and Forecast, they forecast a contined increase in the market for helicopters in 1995. Civil helicopter shipments are projected to total 344 units in 1995 (up 19.4 percent). The sales value of these aircraft are expecte to total $244 million, an increase of 42.7 percent.

FLEET AND HOURS FLOWN

As of January 1, 1994, there were 4,520 active civil rotorcraft in the United States. Of these, 2,864 were turbine powered and 1,646 were piston powered. Rotorcraft flew an estimated 1.9 million hours for an average of 399 hours per active aircraft. Turbine rotorcraft flew 1.5 million hours averaging 506 hours per aircraft.

The data indicate a continued underutilization of the fleet. The improvements in shipments may suggest a gradual impact on fleet capacity, resulting first in new sales to the corporate and EMS markets, where hours flown are normally low. As the recovery continues, increased utilization of larger aircraft may be expected to result in higher shipments to large aircraft markets as well.

PRIMARY USE OF AIRCRAFT

The leading use (30 percent) of all rotorcraft is aerial observation (pipeline patrol, traffic reporting, search and rescue, etc.) followed by air taxi at 16 percent. For piston powered rotorcraft, the leading use is instructional flying (37 percent) with aerial observation a close second--accounting for 28 percent of the total

piston hours flown. The primary use for the multi-engine turbine rotorcraft is air taxi. About 57 percent of all air taxi hours are flown by the multi-engine turbines.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section and presented in tabular form in Table 26 in Chapter IX are derived from the general aviation forecasts (see Chapter V), which are prepared using econometric models and time series analyses. Forecasts of helicopter activity are generated by user category (corporate, business, personal, etc.) and were combined to obtain the national forecasts. The independent variables used in the estimates include the cost of owning a helicopter, total employment, and the cost of oil and gas relative to other prices. One of the underlying assumptions in applying these models to project future fleet size and flight hours is that the cost of fuel will increase. As this occurs, increased petroleum production and exploration will be more profitable, leading to increased rotorcraft usage, particularly in off-shore drilling operations. This, together with continued development of Global Positioning System (GPS) nonprecision approaches and increased use of helicopters in the general economy, are expected lead to an increase in the fleet and flight hours.

ACTIVE FLEET

The active rotorcraft fleet is expected to reach 5,600 in 2006. Compared to the 4,520 active aircraft in 1994, this represents an average annual growth rate of 1.8 percent in the active rotorcraft fleet during the forecast period.

Growth in the active fleet is expected to occur totally in the turbine powered portion of the fleet. The number of turbine powered rotorcraft is expected to reach 4,100 by 2006, an average annual growth of 2.9 percent. In 2006, turbine powered rotorcraft are expected to account for 73.2 percent of the rotorcraft fleet compared to 64.4 percent in 1994. The piston powered portion of the rotorcraft fleet is expected to decline from 1,646 in 1994 to 1,500 in 2006, an average annual decline of 0.8 percent.

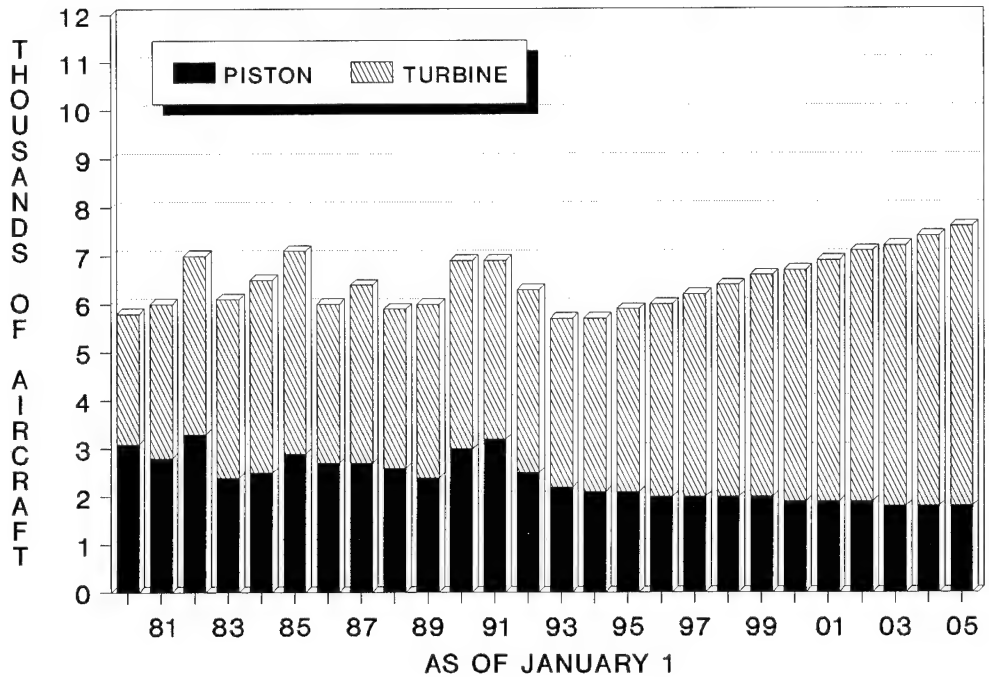
FLIGHT HOURS

The anticipated growth in the active rotorcraft fleet will be accompanied by growth in rotorcraft flight hours, which are expected to increase from 1.9 million in 1994 to 2.9 million in 2006. This represents an average annual growth rate of 3.6 percent.

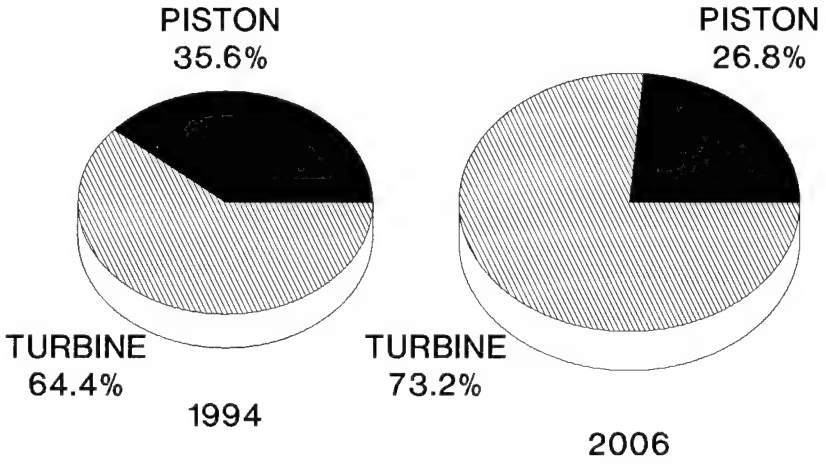
Given that the growth in the active fleet will occur totally in turbine powered rotorcraft, so too will the growth in flight hours for the active fleet. Turbine powered helicopter flight hours are projected to increase by approximately 67 percent during the forecast period, reaching 2.5 million by 2006. This represents an average annual growth 4.3 percent between 1994 and 2006.

Flight hours for the piston powered portion of the active rotorcraft fleet are expected to remain constant at 400,000 hours throughout the forecast period. The decrease in the number of piston powered helicopters and the projected stability in flight hours over the forecast period reflects an increasing level of utilization of the active piston powered portion of the rotorcraft fleet.

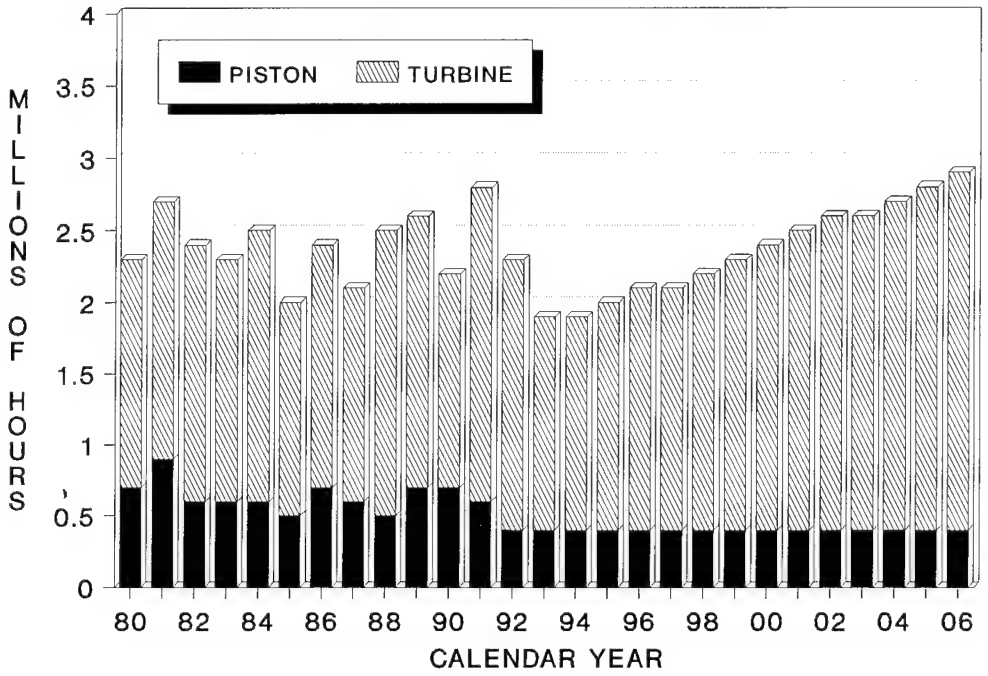
ACTIVE ROTORCRAFT



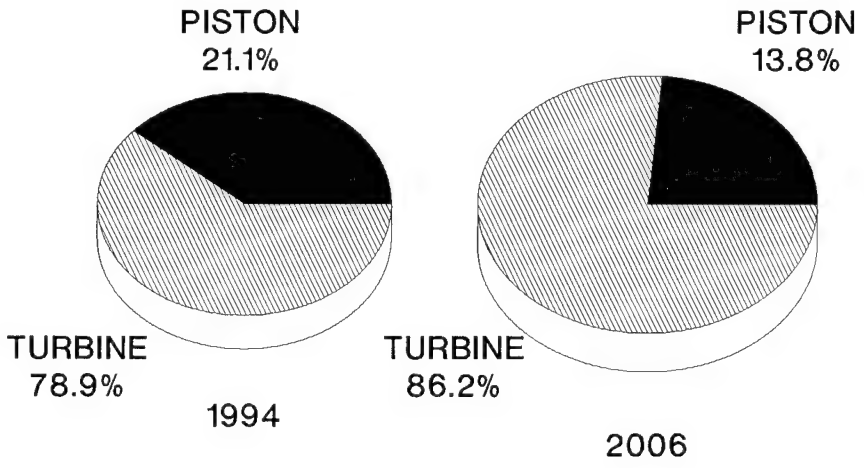
PERCENT BY AIRCRAFT TYPE



ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



FUEL CONSUMED

In 1994, fuel consumption by rotorcraft was estimated to have totaled 47.4 million gallons. Piston powered helicopters consumed 5.6 million gallons, while turbine powered helicopters consumed 41.8 million gallons. By 2006, fuel consumption by rotorcraft is projected to total 73.2 million gallons, 54.4 percent higher than the 1994 level. This represents an average annual growth in fuel consumed of 3.7 percent during the forecast period. The growth in rotorcraft fuel consumption is expected to come totally from the growth in use of turbine powered helicopters. Fuel consumed by turbine powered helicopters is forecast to reach 67.4 million gallons by 2006, an average annual growth rate of 4.1 percent. Fuel consumed by piston powered helicopters is expected to grow slightly to 5.8 million gallons in 2006.

CHAPTER VII

FAA WORKLOAD MEASURES

CHAPTER VII

FAA WORKLOAD MEASURES

The FAA provides the aviation community with three distinct air traffic services: (1) air traffic control tower service at selected airports (402 in fiscal year 1994); (2) traffic surveillance and aircraft separation by air route traffic control centers (22 in fiscal year 1994); and (3) flight planning and pilot briefings at flight service stations (123 in fiscal year 1994). All four aviation system user groups--air carriers, commuters/air taxis, general aviation, and military--use these FAA operational services to enhance the flow and safety of aviation traffic.

Because the four aviation system user groups differ in the demands they impose on the air traffic system, multiple indicators are used to describe the total FAA operational workload. No single measure typifies past trends or future demand for the services provided by the FAA.

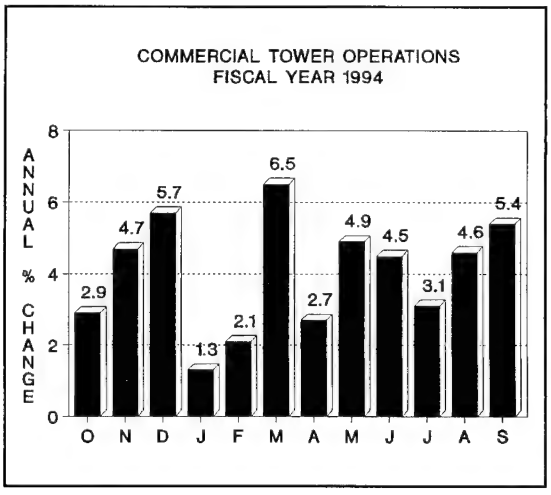
REVIEW OF 1994

FAA TOWER ACTIVITY

Aircraft activity at the 402 FAA towered airports totaled 60.3 million operations in fiscal year 1994, up 0.3 percent from fiscal year 1993. During the last decade (1985 to 1994), towered airport activity has registered increases in all but 3 years.

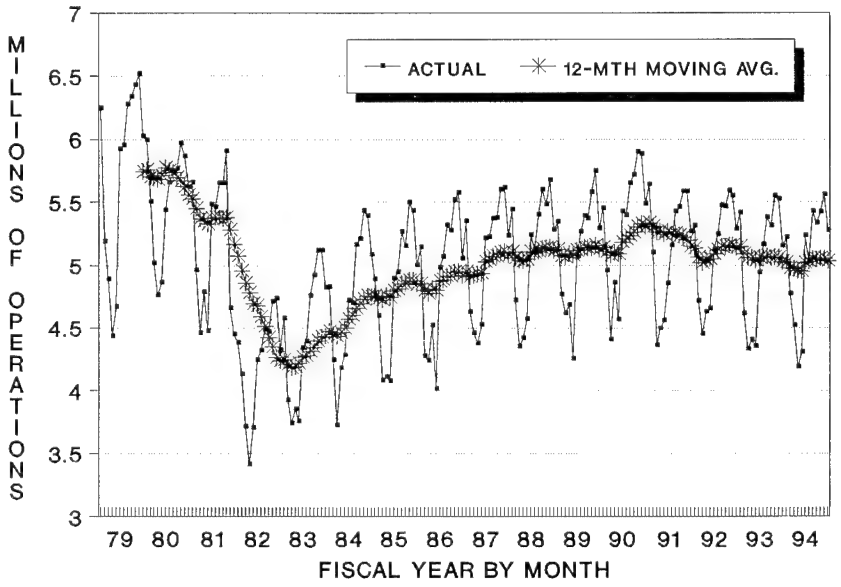
The level of activity recorded at FAA towered airports in 1994 remains 5.8 percent below the operation counts recorded (64.0 million) during the 12-month period immediately preceding the August 1981 air traffic controllers' strike (hereafter referred to as the pre-strike period).

Since 1982, there has been strong demand by commercial aviation services. Commercial activity (the sum of air carrier and commuter/air taxi operations) is up 64.5 percent (4.2 percent

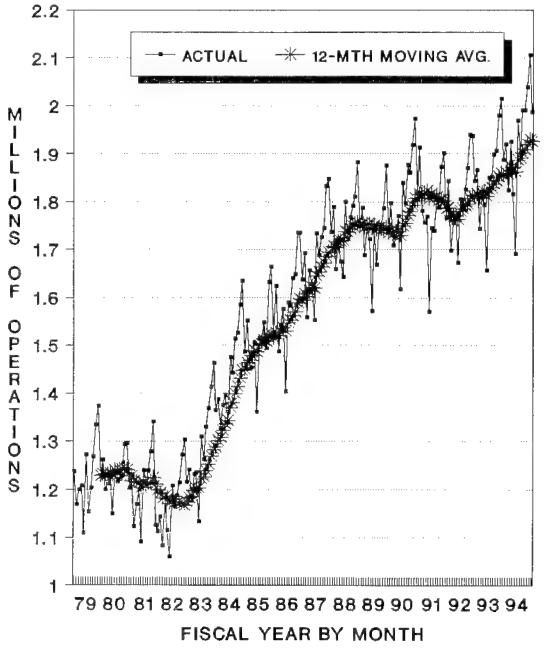


TOWERED AIRPORT OPERATIONS
ACTUAL AND 12-MONTH MOVING AVERAGE

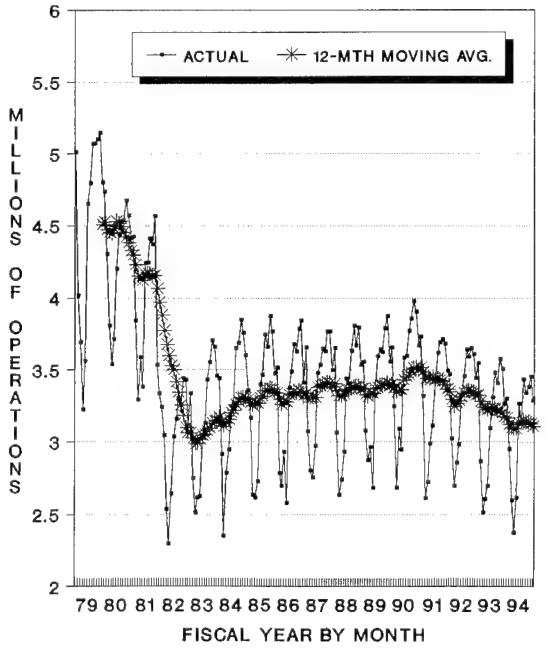
TOTAL OPERATIONS



COMMERCIAL OPERATIONS



NONCOMMERCIAL OPERATIONS

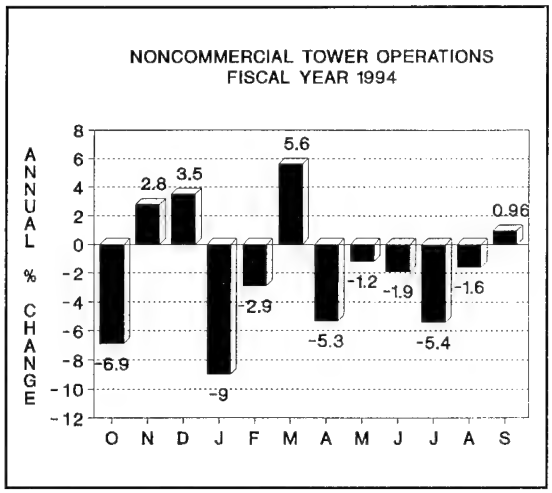


annually) since 1982. Commercial activity increased 4.0 percent in 1994, based on strong growth in both air carrier and air taxi activity. Air carrier activity at FAA towered airports (13.2 million operations) increased 4.6 percent. This significant increase in air carrier operations is largely due to the growth of new-entrant low-cost carriers in the short-haul markets.

The declines recorded in 1991 and 1992 could be attributed to the bankruptcy and liquidation of three commercial air carriers: Eastern Air Lines in January 1991 (4.2 percent of air carrier operations in fiscal year 1990), Pan American Airways in December 1991 (1.8 percent of air carrier operations in FY-91), and Midway Airlines, also in December 1991 (1.6 percent of air carrier operations in FY-91). This factor alone is estimated to have reduced the number of air carrier operations at FAA towered airports by approximately 385,000 operations (3.1 percent) in 1991.

Commuter/air taxi activity increased by 3.4 percent in fiscal year 1994. Its activity level has increased in every year since the user category was designated in 1972. During the past decade, commuter/air taxi activity at FAA towered airports has grown at an average annual rate of 4.2 percent, from 6.9 million operations in fiscal year 1985 to 10.0 million in 1994. Much of this growth is the result of commuter code-sharing and schedule tie-in agreements with the larger commercial air carriers. In addition, growth in recent years has also come from air carrier restructuring, and the giving up of markets to commuters.

Noncommercial activity (the sum of general aviation and military operations), on the other hand, has decreased -0.7 percent annually during the past decade. In fiscal year 1994, noncommercial activity totaled 37.1 million operations, down 1.9 percent from 1993 activity.



After recording increased activity counts in six of the nine years following the 1981 air traffic controllers strike, general aviation activity has declined for four consecutive years. General aviation activity totaled 34.7 million operations in fiscal year 1994, an 11 percent decline from 1990 and a 1.5 percent decline from 1993. In fact, the 1994 operations count was only 73.7 percent of general aviation's pre-strike level of 47.1 million operations.

After increasing by 7.8 percent during the 1989-90 time period, the number of local general aviation operations (14.5 million) has declined 12.7 percent during the past 4 years, reflecting the continuing decline in student training. Itinerant general aviation operations declined by 0.8 percent in fiscal year 1994 to 20.2 million. Itinerant operations in 1994 were at 73.5 percent of pre-strike activity levels (27.5 million), while local operations were at 75.1 percent of the pre-strike level (19.3 million).

Military operations totaled 2.4 million in fiscal year 1994, a 7.0 percent decrease from 1993 activity levels.

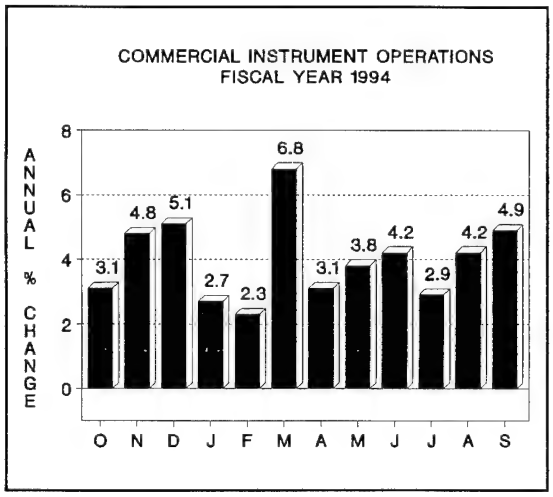
Local military operations showed no change in 1994 at 1.2 million, while itinerant military operations decreased by 7.7 percent to 1.3 million.

INSTRUMENT OPERATIONS

Instrument operations handled at FAA towers totaled 46.7 million in fiscal year 1994, 2.2 percent above the 1993 activity level and 20.4 percent above the level of activity recorded in the pre-strike period (38.8 million). Much of the increase in instrument operations during the past decade (up 21.0 percent) can be attributed to the increase in commercial activity (up 38.0 percent) and to commuter code-sharing and schedule tie-in agreements with the larger commercial airlines.

Commercial aircraft activity (25.1 million operations) increased by 4.6 percent in fiscal year 1994. Air carrier instrument operations totaled 14.3 million, up 4.7 percent.

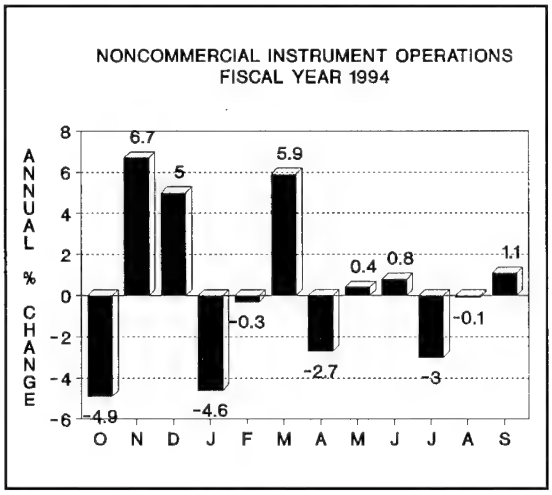
Air carrier counts in 1991/1992 were affected by the liquidation of Eastern, Pan American, and Midway. However, the relatively strong growth of new-entrant carriers is reversing the downward trend. Air carrier instrument



operations during the past 2 years has shown strong growth, up 6.7 percent.

Commuter/air taxi instrument operations at FAA towered airports totaled 10.8 million in fiscal year 1994, up 3.1 percent over 1993 activity levels.

Noncommercial instrument operations (21.7 million) increased 0.5 percent in fiscal year 1994--up 5.8 percent (0.6 annual growth) during the past decade. General aviation activity totaled 18.0 million in 1994, 1.5 per-

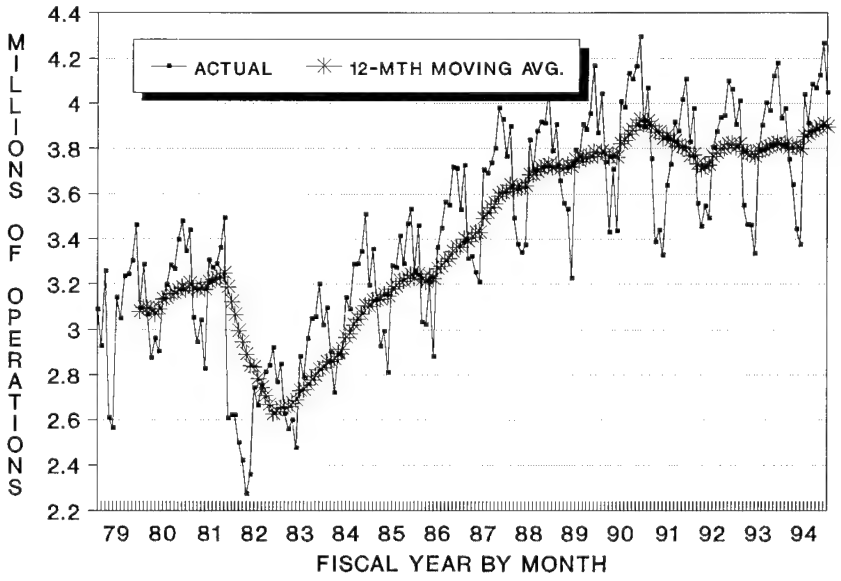


cent higher than the activity level recorded in 1993. During the past 10 years, general aviation activity has increased 9.8 percent. Most of the increase in general aviation activity since 1982 can be attributed to the formation of Terminal Radar Service Areas (TRSAs) at 150 locations in the United States. Under the previous Airport Radar Service Area (ARSA) concept, general aviation aircraft could enter the ARSA without communicating with and without being counted by air traffic control (ATC). Under the TRSA concept all aircraft must be in contact with ATC and, hence, are now counted.

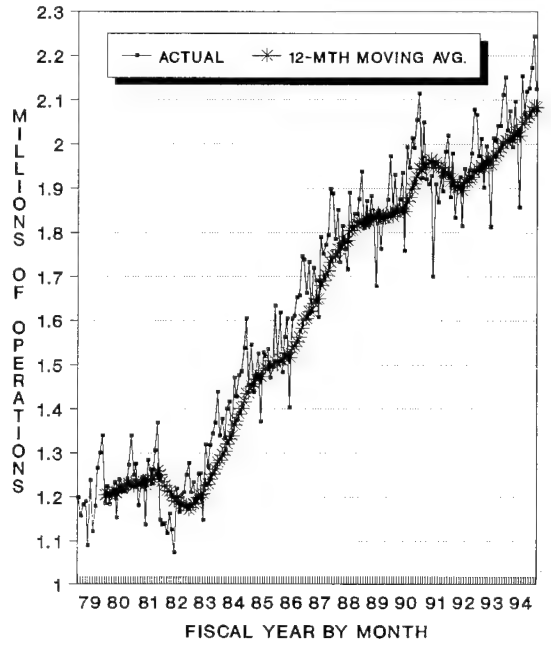
Military instrument operations totaled 3.7 million in fiscal year 1994, down 5.8 percent from 1993 operation counts.

INSTRUMENT OPERATIONS
ACTUAL AND 12-MONTH MOVING AVERAGE

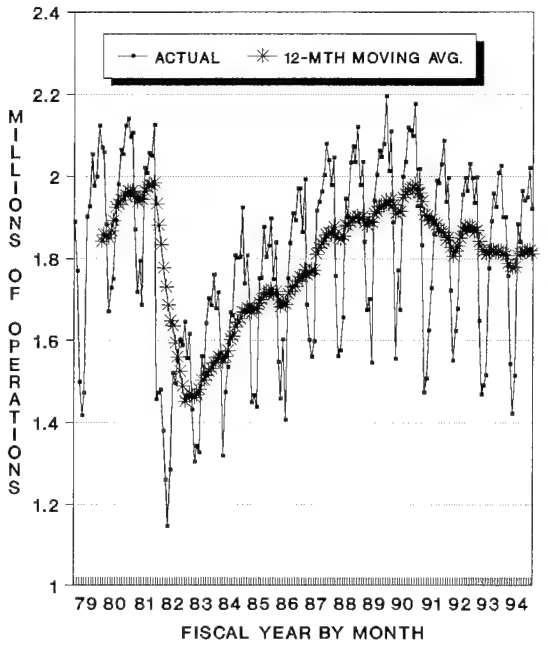
TOTAL OPERATIONS



COMMERCIAL OPERATIONS

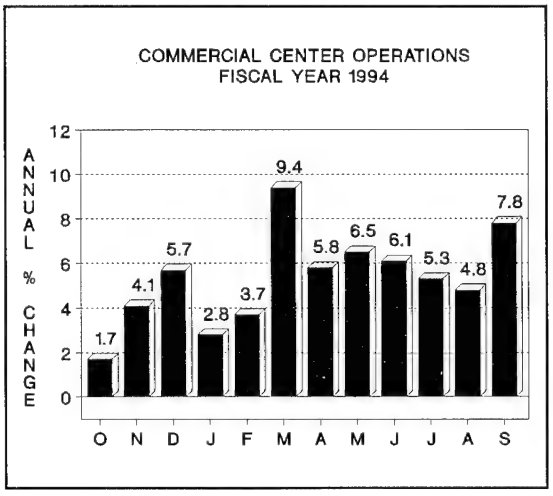


NONCOMMERCIAL OPERATIONS



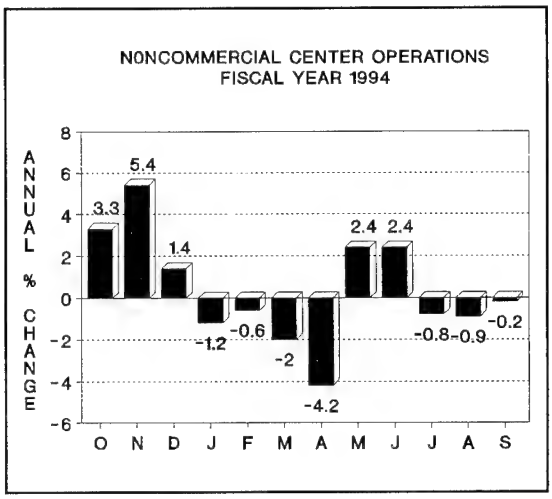
CENTER ACTIVITY

In fiscal year 1994, the number of aircraft flying under instrument rules handled by FAA air route traffic control centers totaled 38.8 million, an increase of 3.7 percent over 1993 activity counts. The increase at en route centers in the last 10 years (up 18.7 percent) can be attributed to the growth in commercial aviation activity (up 36.6 percent). The number of commercial aircraft handled at the centers (26.5 million) increased 5.2 percent in fiscal year 1994. The number of air carrier aircraft handled totaled 20.0 million, while the number



of commuter/air taxi aircraft handled totaled 6.5 million (up 5.4 percent). Again, the liquidations of Eastern, Pan American, and Midway depressed both air carrier and commuter/air taxi center activity counts in 1991 and 1992. However, the significant growth in the short-haul markets during the past 2 years has significantly expanded center operations, up 9.3 percent.

The number of noncommercial aircraft handled (12.3 million) was up 0.8 percent in fiscal year 1994. The number of general aviation aircraft handled totaled 7.7 million, while military activity totaled 4.6 million. Military activity had stabilized at 5.1 million in 1991 and 1992, and the



declines in 1993 and 1994 appear to have been the result of a general cutback in military activity levels.

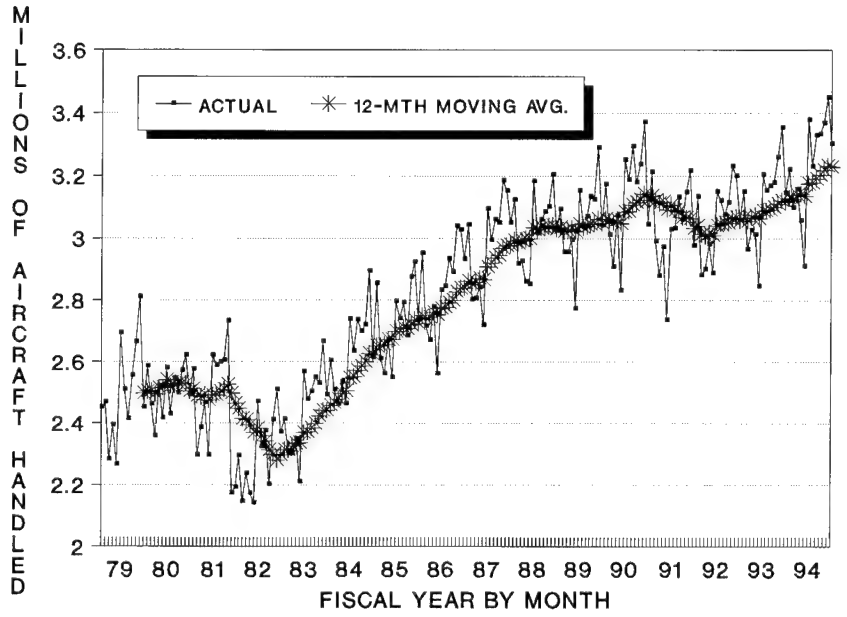
FLIGHT SERVICE STATION ACTIVITY

Pilot briefings, flight plans filed, and aircraft contacts recorded by flight service stations (FSSs) totaled 35.8 million in fiscal year 1994, a decline of 3.8 percent from 1993 activity levels. Activity declined in two of the three categories. The number of aircraft contacted dropped 6.1 percent to 4.6 million, the number of pilot briefings declined 6.0 percent to 9.9 million, and the number of flight plans originated remained unchanged at 6.2 million.

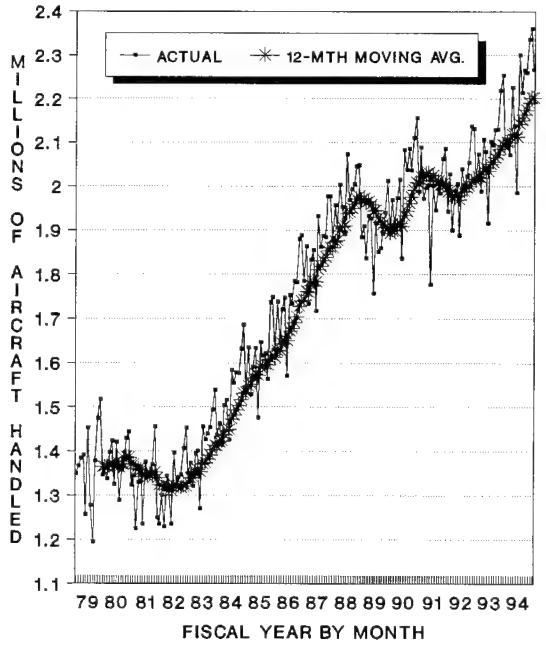
However, the FAA also provides automated flight services, which supplement FSS activity. The Direct User Access Terminal System (DUATS) provides an alternative to the FSS for obtaining pilot briefing information and filing flight plans. Use of this service, introduced in February 1990, is growing. When the services provided through DUATS are included with traditional FSS services, total flight plans filed remain unchanged compared to 1993, but pilot briefs increased 8.4 percent. Thus, the total flight

IFR AIRCRAFT HANDLED
ACTUAL AND 12-MONTH MOVING AVERAGE

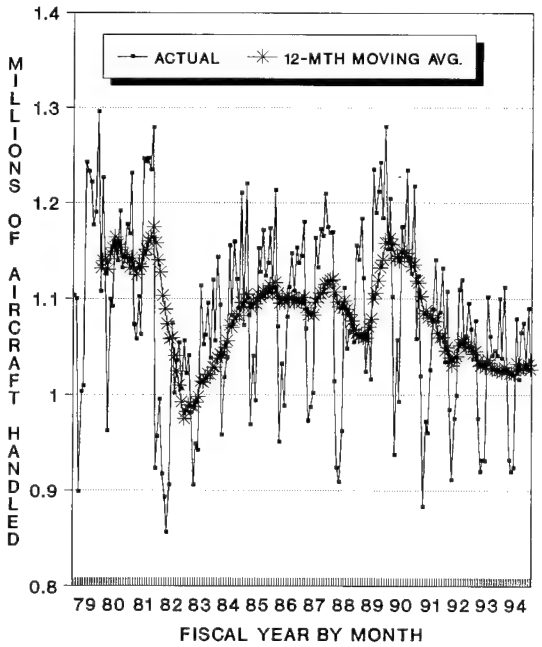
TOTAL AIRCRAFT HANDLED

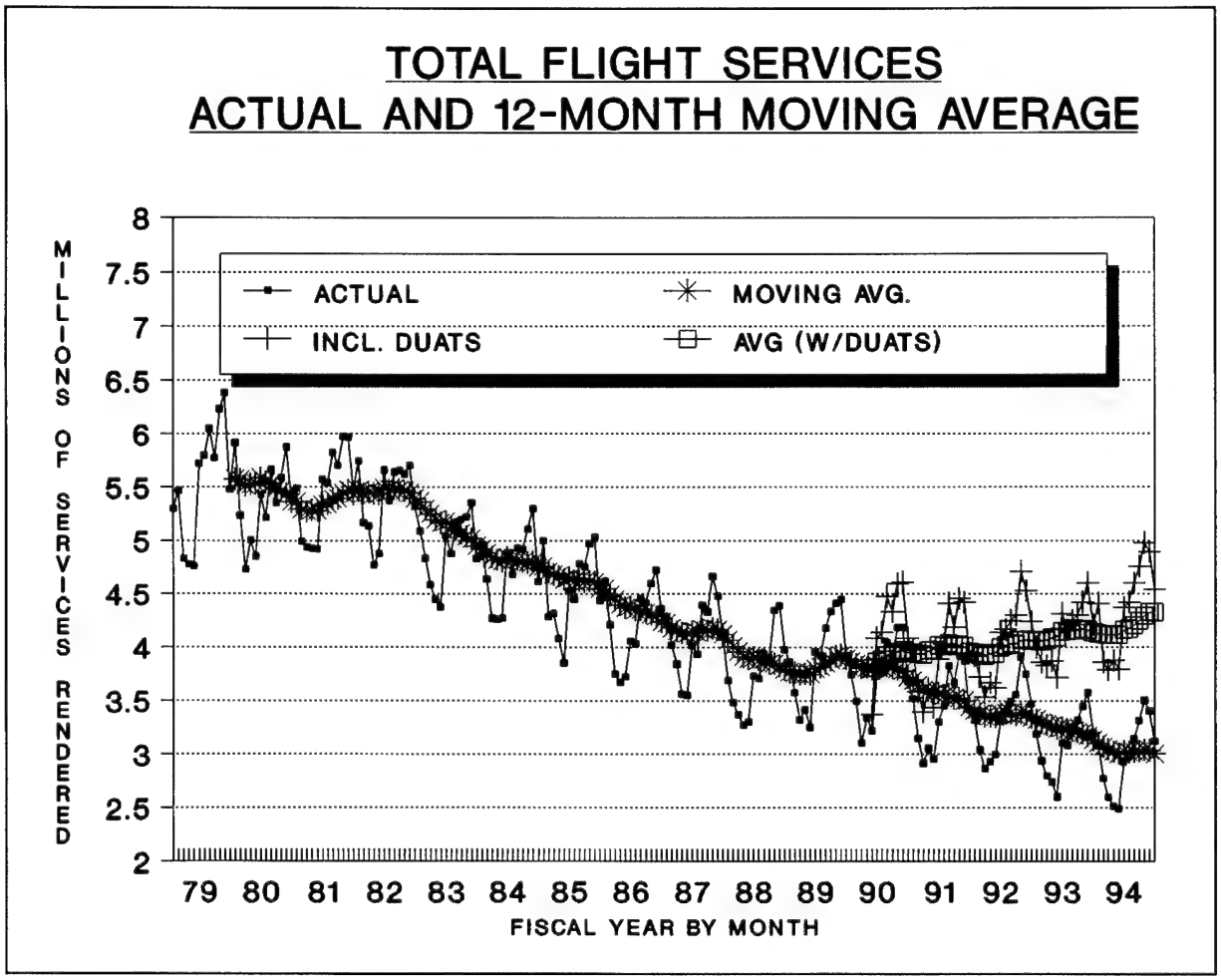


COMMERCIAL AIRCRAFT HANDLED



NONCOMMERCIAL AIRCRAFT HANDLED





services provided by the FAA in 1994 increased 5.1 percent compared to 1993 (see graph).

At the end of fiscal year 1994, there were a total of 59 automated flight service stations (AFSSs) and 64 flight service stations. During 1994, a total of 12 FSSs were consolidated with their respective AFSSs.

CONTRACT TOWERS

The FAA currently contracts out "low activity towers," and the operation counts at these locations are not included in the FAA tower workload measures. There were 32 contract towers in operation during fiscal year 1994, up from 27 in 1993.

Operations at contract towers totaled over 1.9 million in fiscal year 1994, an increase of 11.8 percent over 1993. General aviation accounted for the vast majority (83.0 percent) of the activity at these contract towers, about the same as the level of activity in 1993. Commuter/air taxi operations totaled 162,589 (up 4.3 percent), while military operations totaled 142,371 (up 35.3 percent). Air carrier activity at contract towers declined 1.9 percent in 1994, accounting for 13,446 operations in 1994 (0.7 percent of total contract tower activity).

A listing of the current contract towers can be found in Appendix H. Operation counts for the 402 FAA towered airports and the 32 contract towers, by user group, can be found in the publication FAA Air Traffic Activity FY 1994, compiled by the Statistics and Forecast Branch, Office

of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

FORECAST ASSUMPTIONS

Forecast growth in FAA workload measures includes not only the demand imposed on the existing National Airspace System, but also aviation activity at new locations not previously provided with FAA services. Aviation activity at contract towers is excluded from the workload measures.

NUMBER OF FAA FACILITIES

In fiscal year 1994, the total number of FAA towered airports held at 402. Under the agency's tower conversion plan, 25 of the 110 FAA Level 1 VFR towered airports are scheduled to become FAA contracted towers effective October 1, 1994 and another 25 are scheduled to be converted to contract towers before September 30, 1995. The remaining 60 towers will be converted at later dates that have not been specified.

In 1994, activity at these 50 airports totaled 3.7 million, 6.2 percent of total operations at FAA towered airports. Over 2.9 million of these operations were performed by general aviation aircraft, 78.6 percent of the activity at these 50 airports.

There are 150 Terminal Radar Service Areas (TRSAs)--29 Class B and 121 Class C. Five TRSAs will be consolidated into the Southern CA TRACON over the next 2 years. This trend to consolidate airspace may expand to other areas of the country over the next few years; but these changes will be reflected as they occur.

The number of flight service stations and automated flight service stations totaled 123 at the end of fiscal year 1994: 59 AFSSs and 64 FSSs. Of the remaining FSSs, 33 will be closed and 31 will continue in operation as auxiliary flight service stations in locations of unique weather or operational conditions. This will be in addition to the 61 fully consolidated AFSSs. The current schedule calls for all 61 automated AFSSs to be commissioned and fully consolidated by 1995.

EXTERNAL FACTORS

Despite projections of moderate to strong growth in the United States economy and in activity levels at FAA facilities, there is uncertainty associated with these forecasts. A number of external events could significantly alter the short-term environment and cause the activity levels to be significantly different than those forecast.

In 1994, low air fares, consumer confidence, and overall economic growth both in the U.S. and abroad has stimulated air travel. Although we expect these factors to have a continuing positive effect on aviation over the next several years, relatively large deviations from these trends could alter the forecasts presented in this document.

The significant growth in low-cost airlines such as Southwest and CALite, are forcing airlines to make major changes in their cost structures. If the airlines can achieve their goals, all other things being equal, fares should continue to fall. In effect, competition should push all fares to the marginal costs of the most efficient firms in the industry. In addition, new-entrant low-cost carriers are expected to expand their share of the market and intensify competition.

All of the assumptions cited above should expand air carrier activity at FAA facilities during the next several years. Clearly, changes in these assumptions concerning the industry will cause deviations from the expected outcomes. For example, if relatively high-cost airlines cannot achieve their cost and productivity goals, they may be forced to reduce operations or leave the industry. Under this scenario, growth in activity at FAA facilities could be slowed.

One additional factor to be considered is the impact of the phase-out of air carrier stage-2 aircraft on regional/commuter carriers' activity levels. As stage-2 aircraft are phased out of the air carrier fleet, it is expected that some of the larger carriers may elect to transfer the routes formerly served by these aircraft to their code-sharing partners. Should the number of route transfers greatly exceed current expectations, regional/commuter operations at FAA air traffic facilities could be higher than currently forecast. Conversely, air carrier operations would be lower.

WORKLOAD FORECASTS

FAA TOWER ACTIVITY

In 1994, operations at the 402 towered airports totaled 60.3 million. However, 50 airports are scheduled for conversion to FAA contract towers during fiscal year 1995. If these 50 airports are removed from the 1994 activity counts, activity levels in 1994 would have totaled 56.8 million, the new forecast base. For forecast purposes, we have assumed that the 25 towers to be converted at unspecified dates during fiscal year 1995 will, on average, be converted to contract towers by mid-year (March 31, 1995). As such, growth rates comparing the new base year will be higher than would be expected in 1995 and, consequently, lower than expected in 1996.

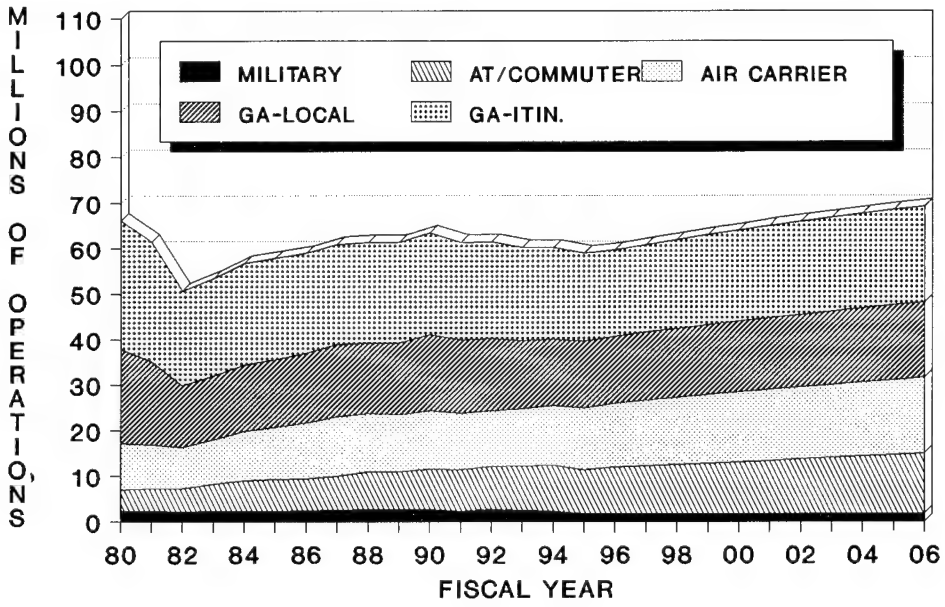
Operations at FAA towered airports are forecast to increase by 3.3 percent (to 58.6 million) in fiscal year 1995. The growth in 1995 is in part due to the continued expansion in the U.S. economy (GDP is expected to be up 2.9 percent), and the expansion of commercial activity in short-haul markets. In addition, economic expansion is expected to spur a recovery in student/pilot training.

FAA tower activity is forecast to decrease to 58.4 million operations in 1996 (due to the removal of 50 contract towers during the fiscal year) and increase to 59.5 million operations (up 1.8 percent) in 1997. During the 12-year forecast period, operations at FAA towered airports are projected to increase by 1.5 percent annually. In absolute numbers, towered operations are projected to total 68.0 million in fiscal year 2006.

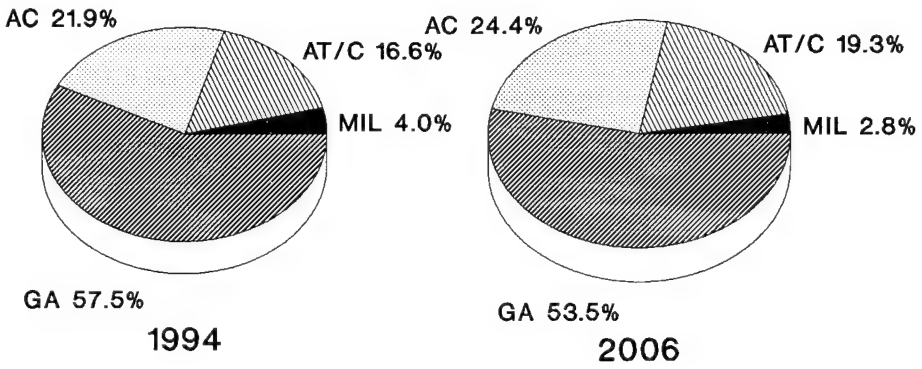
The mix of aircraft using FAA towered airports is expected to remain approximately the same, as the combined total of general aviation and commuter/air taxi operations (i.e., operations performed by smaller aircraft) is expected to grow by about 19.9 percent while the number of air carrier operations is expected to increase 25.8 percent. The combined activities of general aviation and commuters/air taxis are expected to account for 72.8 percent of total tower operations in fiscal year 2006, up only slightly from a 72.7 percent share in 1994. Air carrier operations share of towered airport activity is expected to increase during the forecast period, from 23.2 percent in 1994 to 24.4 percent in fiscal year 2006.

The forecasted activity levels and average annual growth rates for each

AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE*



DISTRIBUTION OF WORKLOAD BY USER GROUP



*50 airports converted to contract towers in 1995.

aviation user group from the year 1994 to the year 2006 are: commuter/air taxi, from 9.5 to 13.1 million operations (2.7 percent annual growth); air carrier, from 13.2 to 16.6 million operations (1.9 percent); and general aviation, from 31.8 to 36.4 million operations (1.1 percent). Itinerant general aviation operations are forecast to increase from 18.6 to 21.2 million operations (1.1 percent annually) and local general aviation operations from 13.2 to 15.2 million operations (1.1 percent annually). Military operations are expected to drop by 100,000 in 1995 and by 300,000 in 1996, leveling off at 1.9 million operations yearly thorough 2006.

Commercial aircraft activity at FAA towered airports is expected to grow at an average annual rate of 2.3 percent during the 12-year forecast period, from 22.7 to 29.7 million. Noncommercial activity is forecast to increase from 34.1 million in 1994 to 38.3 million in fiscal year 2006, an average annual increase of 0.9 percent.

INSTRUMENT OPERATIONS

Instrument operations are forecast to grow by 2.1 percent in 1995, by 1.9 percent in 1996, and by 2.1 percent in 1997. During the 12-year forecast period, instrument operations are expected to increase at an average annual rate of 1.7 percent, growing from a total of 46.7 million operations in 1994 to 57.0 million operations in fiscal year 2006. It is important to note that the increase in the number of FAA contracted towers will not impact instrument operations.

The mix of instrument operations is not expected to change dramatically during the forecast period. The number of commuter/air taxi and general aviation operations performed by smaller aircraft will increase only slightly less than the number of operations performed by the larger, more sophisticated air carrier aircraft (22.9 versus 26.6 percent). By fiscal year 2006, 62.1 percent of all instrument operations are expected to be performed by commuter/air taxi and general aviation aircraft, up from 61.7 percent in 1994.

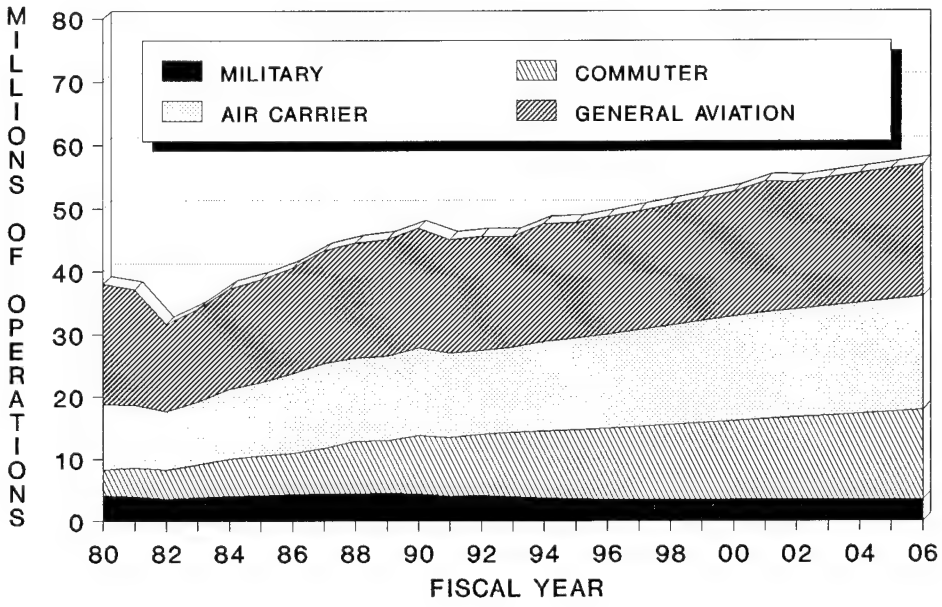
The projected activity levels and average annual growth rate for each user group from the year 1994 to 2006 are: commuter/air taxi, from 10.8 to 14.4 million operations (2.4 percent annually); air carrier, from 14.3 to 18.1 million operations (2.0 percent annually); and general aviation, from 18.0 to 21.0 million operations (1.3 percent annually). Military activity is expected to decrease by 100,000 operations in both 1995 and 1996, and to remain at that level (3.5 million) through 2006.

During the 12-year forecast period, commercial activity is expected to increase at an average rate of 2.2 percent annually, from 25.1 to 32.5 million. Noncommercial activity is forecast to increase from 22.0 million in 1994 to 24.5 million in fiscal year 2006, an average annual growth rate of 0.9 percent.

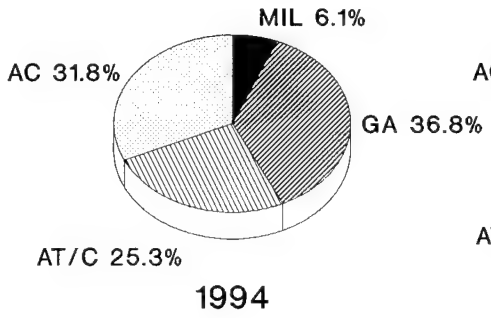
CENTER ACTIVITY

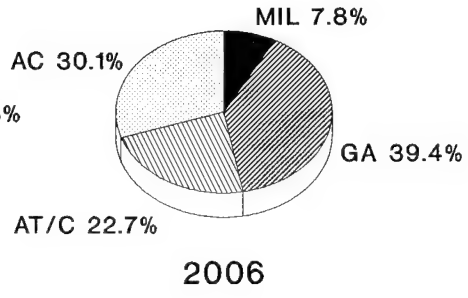
The workload at FAA air route traffic control centers is expected to exhibit relatively moderate growth during the early years of the forecast period, increasing by 2.6 percent in 1995, 2.3 percent in 1996, and 2.0 percent in 1997. During the 12-year forecast period, the number of aircraft handled at en route centers is forecast to increase at an average annual rate of 1.9 percent. The center workload is forecast to increase from 38.8 million aircraft handled in 1994 to 48.9 million in fiscal year 2006.

INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

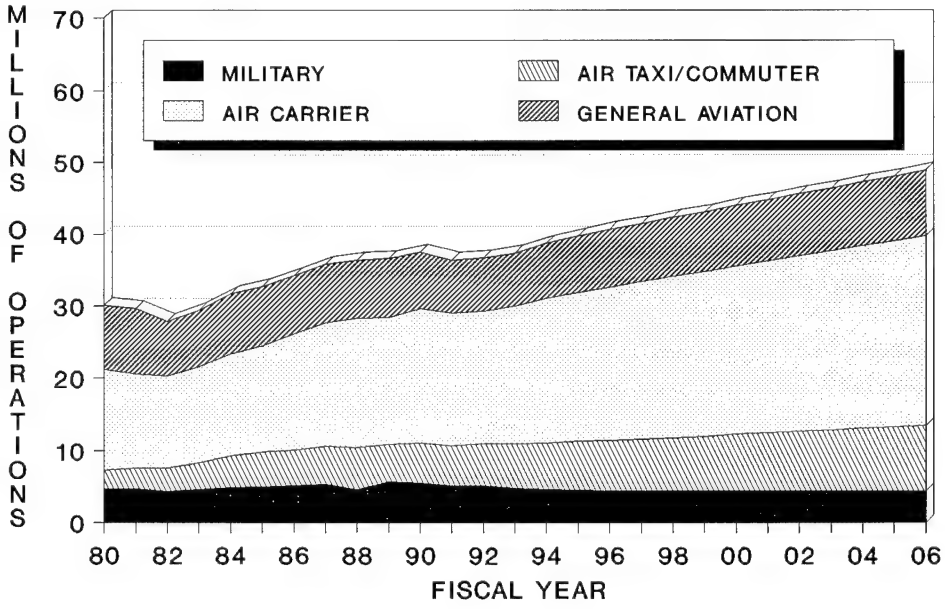


DISTRIBUTION OF WORKLOAD BY USER GROUP

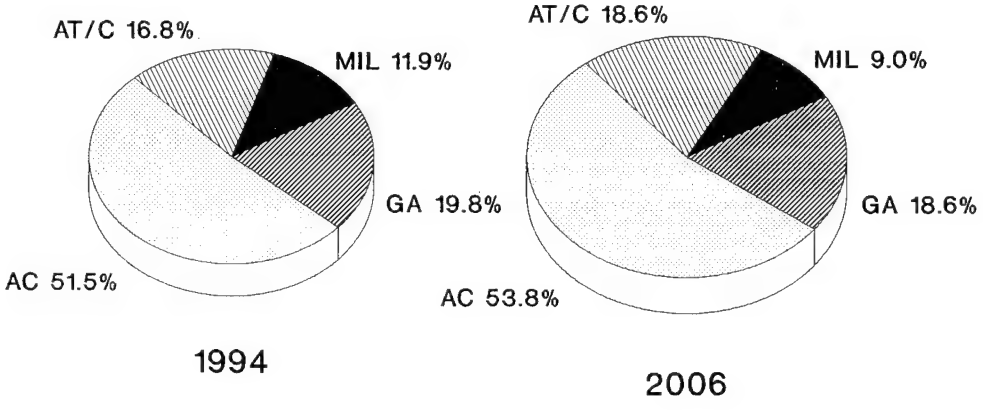




IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



Commercial aircraft activities' share of center workload is forecast to increase from 68.3 percent in 1994 to 72.5 percent in 2006. Between 1994 and the year 2006, the air carrier share is forecast to increase from 51.5 percent to 53.9 percent. The commuter/air taxi share is expected to increase from 16.8 percent to 18.6 percent during the same time period.

The projected activity levels and average annual growth rates for each user group from 1994 to 2006 are: commuter/air taxi, from 6.5 to 9.1 million aircraft handled (2.8 percent annual growth); air carrier, from 20.0 to 26.3 million aircraft handled (2.3 percent annually); and general aviation, from 7.7 to 9.1 million aircraft handled (1.3 percent annually). The number of military operations is expected to drop by 100,000 operations in 1995 and 1996, then remain level at 4.4 million for the balance of the forecast period.

Commercial activity is expected to grow at an average annual rate of 2.4 percent during the 12-year forecast period, from 26.5 to 35.4 million. Noncommercial activity is forecast to increase by 0.7 percent annually, from 12.3 million in 1994 to 13.5 million in fiscal year 2006.

Forecasts for individual centers are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

FLIGHT SERVICE STATION ACTIVITY

Forecast

Total traditional (non-automated) flight services originating at FAA flight service stations are projected to decline throughout the forecast period. In absolute numbers, the number of total flight services is expected to decline to 34.9 million (down 2.5 percent) in 1995, and to 34.0 million (down 2.6 percent) in 1996.

By the end of the forecast period, 2006, total flight services provided by the FAA flight service stations is projected to total 31.6 million (an average annual decline of 1.0 percent).

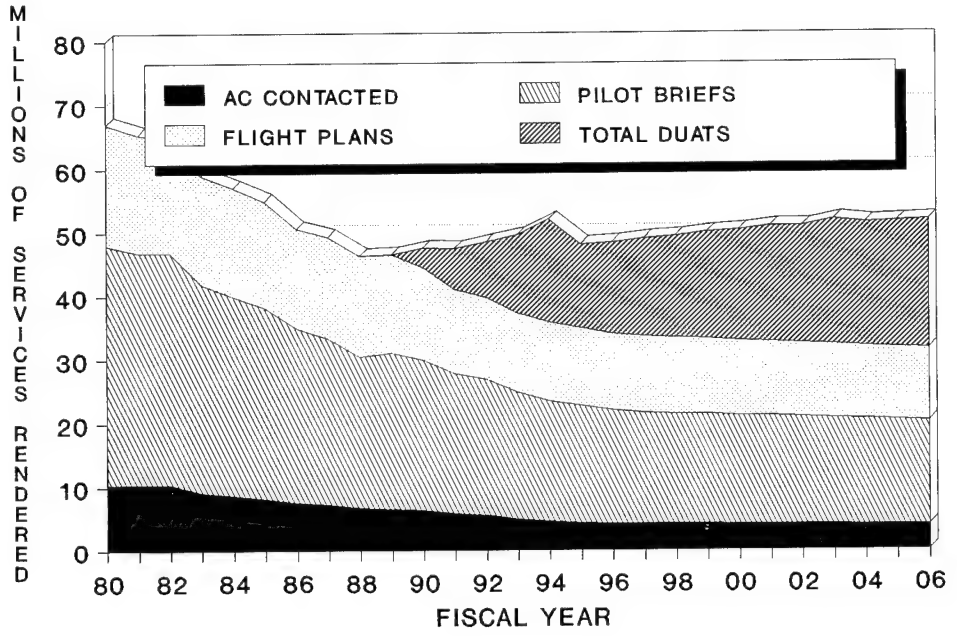
Non-automated Service

The number of pilot briefings is forecast to decline to 9.2 million (down 2.1 percent) in 1995, and 8.9 million (down 3.1 percent) in 1996. Again, pilot briefings are projected to continue to decline throughout the forecast period, declining to 8.1 million in 2006 (an average annual rate of decline of 1.2 percent).

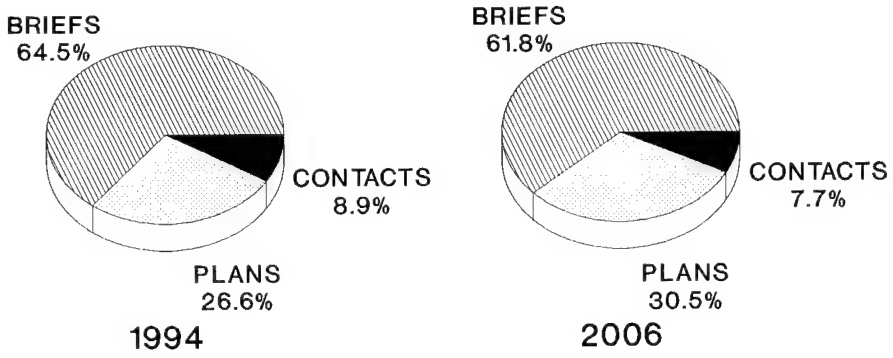
The number of flight plans originated is projected to decline to 6.1 million (down 1.6 percent) in 1995, and then to 6.0 million (down 1.7 percent) in 1996. During the balance of the forecast period, flight plans originated through FAA flight service stations are also expected to continue to decline. By the year 2006, total flight plans originated are projected to be 5.7 million (a 0.7 percent average annual decline).

The number of aircraft contacted is forecast to decline to 4.3 million (down 6.5 percent) in 1995, and 4.2 million (down 2.3 percent) in 1996. Thereafter, the number of aircraft contacted is expected to decline marginally to 4.0 million in 2006 (a 1.2 percent average annual decline).

FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION OF WORKLOAD BY USER GROUP



Automated Flight Service Activity Data

The introduction of new technology for flight service applications has significantly changed the operating environment of the flight service system. Viewed in the larger context of the total National Airspace System, the recent workload trends do not necessarily indicate declining demand for flight planning services. Rather, they may indicate that demand is being met through increased use of automation and new system capabilities resulting in increased system efficiencies and productivity.

Specifically, several factors resulting from automation will tend to dampen the growth in FSS workload measures, as currently defined. First, pilots can now obtain weather briefings through the Telephone Information Briefing System (TIBS), which does not require contact with a flight service specialist, and is not, therefore, included in the FSS pilot briefings count. Second, private weather briefing vendors, participating in recently implemented memorandums of agreement, can also file flight plans for their customers without going through an FSS. Third, starting February 1990, DUATS became operational. Using DUATS, pilots with access to a computer, modem, and telephone can directly access a national weather data base for weather briefings and flight plan filing without ever going through an FSS.

This automated access may be through the pilot's own computer or through those of fixed-based operators offering the service to their customers. None of the flight planning services provided through the above sources is included in the FSS workload measures.

During fiscal year 1994, there was a total of 7.3 million DUATS transactions (a 35.2 percent increase over 1993). If each transaction involves a weather briefing, this represents 7.3 million pilot briefs. In addition, about 749,700 flight plans were filed through the DUATS system (up 4.8 percent). Using the weighted total flight services formula (two times the sum of pilot briefs plus flight plans filed), this translates into approximately 16.2 million total flight services that are not included in the FAA flight service station workload measure.

In fiscal year 1994, with over 4 years of historical DUATS data, forecasts of total system flight service activity have been developed by source of service--DUATS versus FAA flight service stations.

DUATS transactions are projected to decline from 7.3 million in 1994 to 5.8 million in 1995. The large drop is the result of the termination of access to the DUATS system by non-pilot users at the beginning of October 1994. In 1996, DUATS transactions are projected to total 6.2 million, a 6.9 percent increase over the 1995 level. During the period 1997 through 2006, DUAT transactions are forecast to increase at an average annual rate of 2.8 percent, reaching 7.9 million in 2006. For the entire forecast period, flight plans filed through DUATS are expected to increase from approximately 749,700 to 2.2 million, an 8.8 percent average annual increase. By the year 2006, total services provided through DUATS are projected to account for 20.2 million flight services, or 39 percent of total system services.

Total Flight Services

The continued decline in activity at FAA flight service stations is the result of the continuing process of FSS consolidation, and the growing acceptance and utilization of DUATS services.

Total flight services, including non-automated and automated services, are expected to total 48.1 million in fiscal year 1995 compared to 52.0 million in 1994 (down 7.5 percent). This decline is largely due to restricting access to DUATS to only licensed airmen, as noted above. By 2006, total flight services are forecast to reach 51.8 million, an average annual increase of 0.7 percent over the 1995 level.

Forecasts for individual flight service stations are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

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CHAPTER VIII

FORECAST ACCURACY

CHAPTER VIII

FORECAST ACCURACY

The Federal Aviation Administration (FAA) has developed forecast models and established a forecast process that attempts to anticipate changes that may affect the future direction of the industry. Using this forecast process, the FAA provides 12-year forecasts of workload measures annually for aviation-related manpower and facility planning. The FAA frequently sponsors workshops to critique techniques and practices currently used by the FAA and other aviation forecasters and to examine the outlook for the aviation industry and its prospects for future growth. The workshops focus on the forecasting process and ways to improve the reliability and utility of forecasting results.

The tables on pages VIII-3 and VIII-4, provide some measure of the accuracy of FAA workload forecasts. The tables compare forecast data for both the short-term and the long-term periods. The short-term period, 1 to 5 years, is the critical period for manpower planning; the long-term period, for 10 years out, is important for facility planning. The two key FAA workload measures employed are instrument operations and aircraft handled.

For the short-term, the forecast errors normally tend to be small: the 1994 forecast for instrument operations was 1.1 percent lower than final fiscal year counts--off by less than one-half million operations. The forecast for aircraft handled was 2.3 percent lower, 37.9 million forecast versus 38.8 million forecast. The nimber of commercial aircraft handled grew significantly more than was anticipated in 1994. This is the result of the tremendous success enjoyed by the new short-haul carriers in 1994.

The 10 year out forecast errors are higher because of unanticipated external events that have long-term impacts on the aviation system. Contributing external factors include the Gulf War and the concomitant rise in fuel prices, the outbreaks of terrorism in 1986 and 1991, and the failure of general aviation to respond to the economic recovery of the 1980s. Further, the FAA does not use cyclical economic projections in preparing its long-term forecasts. As a result, the 1990/1991 recession was not considered in any of the forecasts prepared prior to 1990.

THE FAA AVIATION FORECASTING PROCESS

INTRODUCTION

The FAA's forecasting process is a continuous and interactive one that involves the FAA Statistics and Forecast

Branch, other FAA Offices and Services, other Government agencies, and aviation industry groups. In addition, the process uses various economic and aviation data bases, econometric models and equations, and other analytical techniques.

Forecasting aviation activity is an essential component of the FAA's planning process. The forecasts are used to determine staffing levels and capital expenditures that will be needed to accommodate growth of activity while maintaining a safe and efficient environment. The forecasts are also used for short-term budget preparation, cost-benefit analyses, and safety analyses. The relative importance of the forecasting function in the planning process can be gauged by examining the major changes being made to the airspace infrastructure through the Capital Investment Plan out to the year 2007. These changes are being made, in large part, to accommodate the projected growth in air traffic.

To improve the air traffic control and air navigation systems, the FAA is installing new aircraft landing systems, developing new radar and communication systems, and upgrading the weather services it provides to aircraft operators. Because of the sizable investments being made in the National Airspace System, it is essential that the FAA develop and use the most accurate and reliable forecasts possible. Thus, the periodic review and evaluation of the forecasting procedures, models, forecast assumptions, and forecast results constitute an essential part of the process.

SYSTEM BACKGROUND

As part of the need to ensure safe and efficient operation of the National Airspace System, FAA operates 402 air traffic control towers, 22 air route traffic control centers (ARTCC), and 133 flight service stations (FSS). Many of the nonautomated flight service stations will be absorbed into 59 new automated facilities (AFSS). However, given the Congressional mandate to implement a system of auxiliary flight service stations in addition to the 59 AFSSs, 31 of the flight service stations that were scheduled to be closed will remain open.

FAA facilities perform a large and diverse number of services for the aviation community. The FAA towers provide sequencing and separation services to pilots and aircraft arriving at or departing from individual airport facilities. These services are provided to the various categories of aircraft: air carriers, commuters/air taxis, general aviation, and military. The sum of arrivals and departures (landings and takeoffs) is generally referred to as aircraft operations. Arrivals and departures are further classified as itinerant or local operations depending on the purpose of the flight or the distance between the airports from which the landings and takeoffs were made. These operations are measures of workload or activity at individual airports. The sum of these operations at the 402 towered airports make up the national count of aircraft operations.

Another important workload measure at FAA towered airports is the number of instrument operations; i.e., aircraft operations performed in accordance with an instrument flight rule (IFR) flight plan, or an aircraft flight where IFR separation between aircraft is provided by the facility. Instrument operations are further subdivided into: (1) primary instrument operations--separations and sequencing services provided to aircraft landing at the airport providing the service; (2) secondary instrument operations--services provided to aircraft landing at a nearby airport; and (3) overs--services provided to aircraft that originate outside the ARTCC area and pass through

FAA INSTRUMENT OPERATIONS FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published--Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1988	44.5	45.4	43.0	43.8	43.6	44.2	49.9
1989	45.0	45.8	47.2	44.2	45.7	45.5	53.9
1990	46.8	46.4	47.7	49.1	45.4	47.3	54.2
1991	45.1	47.8	48.0	49.5	50.7	46.4	52.4
1992	45.6	46.1	48.9	49.6	51.3	51.8	51.5
1993	45.7	46.2	47.4	50.1	50.8	52.5	50.3
1994	46.7	46.3	47.6	48.8	51.4	52.2	52.0
1995		*47.7*	47.0	48.9	50.1	52.9	52.2
1996			*48.6*	48.0	50.0	51.2	51.7
1997				*49.6*	49.0	51.0	57.3
1998					*50.6*	50.1	58.5
1999						*51.6*	57.6
2000							58.9
2004							*55.6*

Year Being Forecast	Forecast Activity Percent Error Published -- Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1987	(3.9)	(2.5)	(2.5)	(2.3)	2.1	5.8
1989	1.8	4.9	(1.8)	1.6	1.1	19.8
1990	(0.8)	1.9	4.9	(3.0)	1.1	13.6
1991	6.0	6.4	9.8	12.4	2.9	16.2
1992	1.1	7.2	8.8	12.5	13.6	12.9
1993	1.1	3.7	9.6	11.2	14.9	10.1
1994	(1.1)	1.9	4.5	10.1	11.8	11.3

Note on how to read this table: In 1993 we forecast 46.2 million operations would occur in 1994. In fact 46.7 million operations were recorded, meaning the forecast was 1.1 percent higher than actual. In 1988 we forecast 47.7 million operations would occur in 1990. This forecast was 1.9 percent higher than actual. The 1994 forecast is shown in bold italics.

FAA ARTCC AIRCRAFT HANDLED FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published--Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1988	36.4	37.0	36.6	36.1	36.1	35.1	42.8
1989	36.6	37.2	38.0	37.6	37.2	37.4	42.0
1990	37.4	37.8	38.2	39.2	38.7	38.4	42.2
1991	36.4	38.5	39.1	39.7	40.3	39.6	40.3
1992	36.7	37.3	39.6	40.1	40.8	41.4	39.3
1993	37.5	37.5	38.3	40.6	41.0	41.6	40.7
1994	38.8	37.9	38.4	39.4	41.5	41.9	43.6
1995		***39.8***	38.6	39.3	40.3	42.7	43.6
1996			***40.7***	39.4	40.0	41.1	44.0
1997				***41.5***	40.3	40.7	46.0
1998					***42,4***	41.1	46.1
1999						***43.4***	46.0
2000							47.1
2003							***47.3***

Year Being Forecast	Forecast Activity Percent Error Published -- Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1988	1.6	0.5	(0.8)	(0.8)	(3.6)	17.6
1989	1.6	3.8	2.7	1.6	2.2	14.7
1990	1.1	2.1	4.8	3.5	2.7	12.8
1991	5.8	7.4	9.1	10.7	8.8	10.7
1992	1.6	7.9	9.2	11.1	12.8	7.1
1993	0.0	2.1	8.3	9.3	10.9	8.5
1994	(2.3)	(1.0)	1.5	7.0	8.0	12.4

Note on how to read this table: In 1993 we forecast 37.9 million aircraft would be handled in 1994. In fact 38.8 million aircraft were recorded, meaning the forecast was 2.3 percent lower than actual. In 1988 we forecast 38.2 million aircraft would be handled in 1990. This forecast was 2.1 higher than actual. The 1994 forecast is shown in bold italics.

the area without landing. Another contributor to work load may be advisory services being offered to aircraft flying under visual flight rules (VFR) in certain positively controlled airspace.

Each ARTCC controls aircraft that are flying under instrument flight rules in the center's designated geographic control area. The workload measure for the centers is the number of IFR aircraft handled, which is two times departures, plus overs. The IFR counts are categorized by user groups.

Flight service stations provide a variety of services to the aviation community. They collect and disseminate meteorological and other flight information, provide briefings to pilots, and provide assistance in emergencies to lost, disoriented, or downed airmen. The workload measure at flight service stations, total flight services, is equal to the sum of flight plans filed and pilot briefs, multiplied by two, plus the number of aircraft contacted.

The introduction of new technology to flight service stations has changed operating environments. Demand for flight planning services is actually being met through increased use of automation and new system capabilities. The result is increases in system efficiency and productivity.

The FAA must consider at least 133 variables when producing a set of national forecasts. (The number does not include derived subtotals and totals.) Of these, four economic independent variables are obtained from sources external to the FAA and the FAA has no control over these truly exogenous variables. There are 12 quantifiable air carrier forecast assumptions and four quantifiable regional/commuter carrier forecast assumptions. Within justifiable limits, these forecast assumptions are under the control of the analysts who develop the forecast. There are 83 aviation variables that are not FAA workload measures but that influence the workload measures in one way or another. Finally, there are 30 aviation variables that are the workload measures used by the FAA for policy and planning considerations and for manpower and investment planning.

The table at the end of this chapter contains a list of the variables and the sources of the historical data and their relationship to the forecast process. Forecasts of the economic variables and the military fleet and its hours flown are developed outside the FAA. All other forecasts are developed by the FAA.

Research undertaken in the early- and mid-1970s indicated that some measures of economic activity (such as gross domestic product or total employment) and some measures of prices (for example, aircraft prices and aviation fuel prices) were useful predictors of aviation activity. Some unique events (including the failure of U. S. air carriers to follow rational pricing policies; e.g., the destructive fare wars of 1986 and 1992, and the prolonged depressed state of the general aviation manufacturing industry) have altered the relationships between the key aviation variables and the economic variables used previously. It has been difficult, therefore, to produce economic or econometric models that predict aviation activity with the same degree of reliability as the models developed in earlier periods. Thus, for the present, the forecasters must rely to a greater degree on subjective judgment, evaluation, and expertise than was required previously. This is not at all unusual in times of significant change in a volatile industry.

THE FAA FORECASTING PROCESS

The FAA forecasting process is an interactive system that combines econometric and time series model

results with aviation industry forecasts, expert opinions, and anticipated policy impacts to derive a set of FAA aviation forecasts that are used in the decisionmaking process. The following flow diagram shows a generalized version of the FAA aviation forecasting process.

The first step in developing the forecasts is to enter the economic and demographic variables into a set of econometric models or equations that represent a simplified version of the real world. The degree of accuracy of the forecasts of aviation activities depends on both the accuracy of the forecasts of the independent variables and the ability of the models to portray activities in the real world.

The mechanical execution of forecast models is only the first step in producing a set of forecasts. In general, these models and equations are simple portrayals of a complex system. They cannot account for a number of political, social, psychological, and economic variables and for all the interrelated actions and reactions that eventually lead to a particular set of results. It is particularly important, therefore, that the initial model results are reviewed, revised, and adjusted to reflect the analysts' best judgment of the impacts of the events occurring or expected to occur during the forecast period.

The FAA forecasting process is both continuous and iterative. As such, it is important to evaluate the forecast results and to determine the basis of the deviations of the forecast values from the actual observed values. The analysis of the errors generally identifies the causes of the deviations and helps determine the proportion due to improper model specifications, erroneous forecasts of independent variables, erroneous forecast assumptions, or incorrect analysts' judgments and opinions. If warranted, the forecast error analysis may lead to a reformulation of the model and to additions or deletions of independent variables, revisions of forecast assumptions, and/or changes in analysts' opinions and judgments about future events.

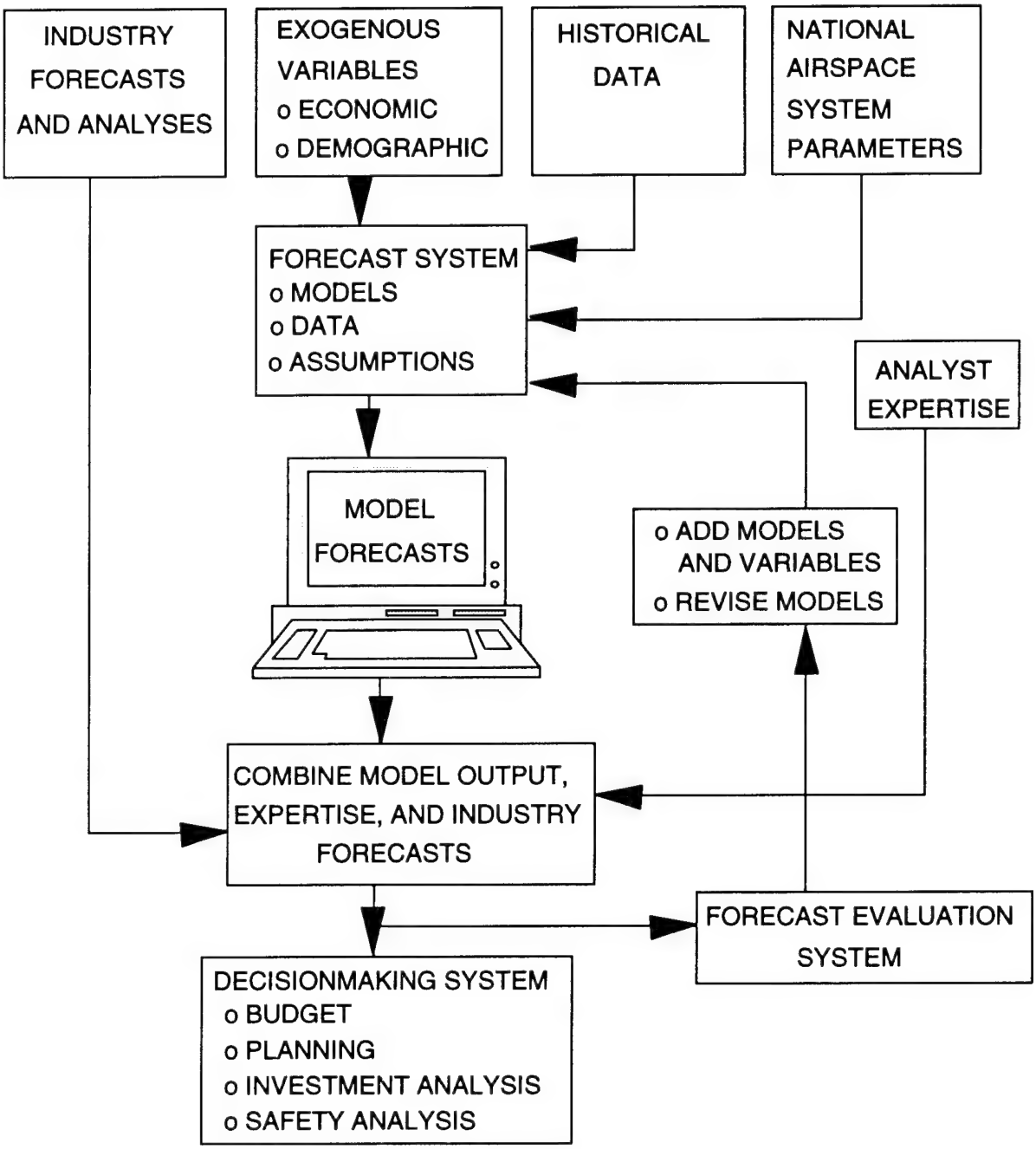
FORECAST EVALUATION

It is essential that the FAA forecasts of the demand for services at the FAA towers, air route traffic control centers, and the flight service stations be accurate. Large forecast errors can lead to inefficient allocation of resources which, in turn, could lead to capacity constraints and delays or to excess capacity in the National Airspace System. For this reason, FAA must continuously evaluate the forecasting process and its results.

The evaluation of the forecast process proceeds on several fronts. On a monthly basis, FAA tracks its short-term forecasts of aircraft operations, instrument operations, IFR aircraft handled, and flight services vis-à-vis the actual counts at the facilities. This tracking system alerts FAA management to unexpected deviations from the trends suggested by the forecasts. Inquiries are then initiated to determine the cause(s) of the differences and revised short-term forecasts may be generated, if necessary.

To help the analysts make correct decisions and informed judgments when developing the forecast assumptions, FAA holds meetings with industry representatives to discuss industry trends, recent developments, and possible future courses of events. Every 2 years, for example, in cooperation with the National Academy of Sciences, Transportation Research Board (TRB), the FAA sponsors a "forecast assumptions workshop." This workshop is attended by 70 to 80 industry planners and forecasters representing the airlines, aircraft manufacturers, engine manufacturers, and other industry groups.

FAA FORECASTING SYSTEM



The participants in various subgroups identify specific assumptions about the short-term and long-term future trends of the economic and aviation variables that are important to their segments of the industry, indicate why these are considered important, and show why specific trends are anticipated. After discussing the assumptions, the entire group attempts to reach a consensus about the key variables affecting the industry and the most likely future courses of these variables. Finally, the TRB publishes a workshop report. The participants benefit from the discussions and the analysts have the TRB workshop report as a benchmark for preparing forecasts or for evaluating forecasts prepared by other organizations. Assumptions developed at the Eighth International Workshop (September 13-15, 1993) were used extensively in preparing last year's forecasts. The Ninth International Workshop is planned for September 1995.

Formal and informal meetings with individuals and representatives of specific industry groups are another way the FAA promotes dialogue and discussion with the aviation community and solicits input and comments. Meetings are held regularly with the aircraft manufacturers, with members of the Air Transport Association, and with members of the General Aviation Manufacturers Association. In addition, FAA analysts maintain one-on-one contact with industry representatives.

Another intermediate step in the FAA aviation forecast process is the public dissemination of the forecast results, solicitation of industry comments, and critique of the forecasts. One of the main avenues for this purpose is the Commercial Aviation Forecast Conference held annually in February or March. Now in its twentieth year, the conference is generally attended by 500 participants who include airline executives, aircraft and engine manufacturers, consumer groups and other industry representatives, and the news media. To the maximum extent possible, FAA responds to questions raised about the forecasts both during and after the conference.

Because the importance of U. S. general aviation and the fact that its issues and problems cannot be adequately addressed in a single conference, the FAA also holds an annual two-day General Aviation Forecast Conference. This conference, now in its fifth year, is attended by 250 participants from all segments of the general aviation community.

An important part of the conferences is the opportunity for various segments of the aviation community to make technical presentations on a variety of topics of interest to the aviation community. The forecast conferences establish avenues of communication through which FAA releases its forecast to the aviation community and the public and receives comments, criticisms, and feedback about the forecasts. The FAA also receives valuable information and insights through the papers presented at the forecast conferences. These papers are published annually in individual conference proceedings and are distributed to all conference attendees or by request.

FAA also seeks to improve forecast accuracy and credibility by inviting FAA regional and state participation in the forecast process. For example, facility level terminal area forecasts (published separately as the Terminal Area Forecasts) and flight service station forecasts are circulated to FAA regions for review and comments. The comments and suggested changes are incorporated in the final facility level reports. In the case of the terminal area forecasts, the FAA regions have the capability to make changes on personal computers. The final facility level forecasts derived by this procedure must be consistent with the national forecasts.

Periodically, FAA prepares a technical report that compares the accuracy of

the forecasts of key workload measures with the accuracy of forecasts of economic variables prepared by major forecasting services. Based on the results of these studies, the FAA forecasts compare favorably with those produced by these major forecasting services.

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
ECONOMIC:	
Gross Domestic Product (GDP)	OMB, DRI, Evans, WEFA
Consumer Price Index (CPI)	OMB, DRI, Evans, WEFA
Oil and Gas Deflator	OMB, DRI, Evans, WEFA
AIR CARRIER:	
FORECAST ASSUMPTIONS	
Domestic Operations:	
Average seats per aircraft	RSPA/computed
Average passenger trip length	RSPA/computed
Revenue per passenger mile (current $)	RSPA/computed
Revenue per passenger mile (1982-84 $)	Computed
Average jet fuel prices (current $)	RSPA/computed
Average jet fuel prices (1982-84 $)	Computed
International Operations:	
(Same as Domestic)	(Same)
SCHEDULED PASSENGER TRAFFIC	
Domestic:	
Revenue passenger miles (RPM's)	RSPA
Revenue passenger enplanements	RSPA
Available seat miles	RSPA
Load factors	Computed
International:	
Revenue passenger miles by Regions	RSPA
Revenue passenger enplanements by Regions	RSPA
Available seat miles	RSPA
Load factors	Computed
FLEET	
2-Engine narrowbody	FAA/AFS-620
3-Engine narrowbody	FAA/AFS-620
4-Engine narrowbody	FAA/AFS-620
2-Engine widebody	FAA/AFS-620
3-Engine widebody	FAA/AFS-620
4-Engine widebody	FAA/AFS-620

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
HOURS FLOWN BY EQUIPMENT	
(Same as Fleet)	RSPA
FUEL CONSUMED	
Jet:	
Domestic air carriers	RSPA
International air carriers	RSPA
General aviation	FAA/APO-110
Aviation Gasoline:	
Air carriers	FAA/APO-110
General aviation	FAA/APO-110
REGIONAL/COMMUTER:	
FORECAST ASSUMPTIONS	
Average seats per aircraft	RSPA/Computed
Average passenger trip length (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA/Computed
Average load factor	RSPA/Computed
PASSENGER TRAFFIC	
Revenue passenger enplanements (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA
Revenue passenger miles (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA
FLEET	
Less than 15 seats	FAA/AFS-620
15 to 19 seats	FAA/AFS-620
20 to 40 seats	FAA/AFS-620
More than 40 seats	FAA/AFS-620
HOURS FLOWN	
Total for all passenger airlines	RSPA

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
GENERAL AVIATION:	
FLEET	
Single engine piston aircraft	FAA/APO-110
Multi-engine piston aircraft	FAA/APO-110
Turboprop aircraft	FAA/APO-110
Turbojet aircraft	FAA/APO-110
Piston-powered rotorcraft	FAA/APO-110
Turbine-powered rotorcraft	FAA/APO-110
Other general aviation aircraft	FAA/APO-110
NUMBER OF AIRCRAFT BY REGION	
Total aircraft in each of nine FAA Regions	FAA/APO-110
HOURS FLOWN	
Hours flown by equipment type (See general aviation fleet)	FAA/APO-110
FUEL CONSUMED	
Fuel consumed by equipment type (See general aviation fleet)	FAA/APO-110
ACTIVE PILOTS	
Students	FAA/APO-110
Private pilots	FAA/APO-110
Commercial	FAA/APO-110
Airline transport	FAA/APO-110
Helicopter	FAA/APO-110
Glider	FAA/APO-110
Other	FAA/APO-110
Instrument rated	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
FAA WORKLOAD MEASURES:	
FAA TOWERS	
Number of FAA Towers	FAA/APO-110
Aircraft Operations:	
Air carrier itinerant operations	FAA/APO-110
Air taxi/commuter itinerant operations	FAA/APO-110
General aviation itinerant operations	FAA/APO-110
Military itinerant operations	FAA/APO-110
General aviation local operations	FAA/APO-110
Military local operations	FAA/APO-110
Instrument Operations:	
Air carrier	FAA/APO-110
Air taxi/commuter	FAA/APO-110
General aviation	FAA/APO-110
Military	FAA/APO-110
Non-IFR Instrument Operations:	
Terminal control areas	FAA/APO-110
Expanded radar service areas	FAA/APO-110
AIR ROUTE TRAFFIC CONTROL CENTERS	
IFR Departures:	
Air carrier	FAA/APO-110
Air taxi/commuter	FAA/APO-110
General aviation	FAA/APO-110
Military	FAA/APO-110
IFR Overs:	
(Same as IFR departures)	FAA/APO-110
FLIGHT SERVICE STATIONS	
IFR-DVFR flight plans originated	FAA/APO-110
VFR flight plans originated	FAA/APO-110
Pilot briefings	FAA/APO-110
Air carrier aircraft contacted	FAA/APO-110
Air taxi/commuter aircraft contacted	FAA/APO-110
General aviation aircraft contacted	FAA/APO-110
Military aircraft contacted	FAA/APO-110
IFR-DVFR aircraft contacted	FAA/APO-110
VFR aircraft contacted	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
MILITARY:	
FLEET	
Jet	DOD
Turboprop	DOD
Piston	DOD
Helicopter	DOD
HOURS	
Hours flown by equipment (See Fleet)	DOD
TERMINAL AREA FORECASTS (2000 Towered and Nontowered Airports):	
ENPLANEMENTS	
U. S. Air Carrier	RSPA
Foreign Flag Carrier	INS
Commuter	RSPA
Air Taxi	FAA/TSC
OPERATIONS	
Towered Airports:	
Air Carrier	FAA/APO-110
Commuter/Air Taxi	FAA/APO-110
General Aviation	FAA/APO-110
Military	FAA/APO-110
Nontowered Airports	FAA/NFDC

OMB--Office of Management and Budget
DRI--DRI/McGraw-Hill, Inc.
Evans--Evans Economics, Inc.
WEFA--The WEFA Group
RSPA--Research and Special Programs Administration, Department of Transportation
AFS-620--Operations Systems Branch, FAA
APO-110--Statistics and Forecast Branch, FAA
DOD--Department of Defense
INS--Immigration and Naturalization Service, Department of Justice
TSC--Volpe National Transportation Systems Center, RSPA
NFDC--National Flight Data Center, FAA

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

FISCAL YEARS 1995 - 2006

Chapter IX provides the detailed data for the National Aviation and FAA workload series forecasted by the FAA Office of Aviation Policy, Plans, and Management Analysis. The following should be noted:

- o Table 10 - Contains the unduplicated passenger traffic reported by U.S. scheduled air carriers reporting on RSPA Form 41 and commuter carriers reporting on RSPA Form 298-C.

- o Table 11 - Those carriers contained in the Air Carrier forecast data base are listed in Appendix A.

  - Includes the following traffic which is also reported as commuters/regionals traffic in Table 19.

	ENPLANEMENTS (Millions)	RPMs (Millions)		ENPLANEMENTS (Millions)	RPMs (Millions)
1987	4.100	683.6	1991	6.559	1,315.3
1988	3.117	583.3	1992	9.981	1,906.5
1989	4.072	861.2	1993	12.574	2,632.3
1990	4.674	984.9	1994	16.558	3,428.3

- o Table 19 - Includes the duplicated traffic listed above for those air carriers and commuters/regionals reporting on both RSPA Forms 41 and 298-C.

  - Forecasts and historical data exclude Alaska and foreign territory traffic.

  - The forecasts exclude the following carriers because of the predominance of jet aircraft in their fleets : Altair (beginning in 1982), Empire (1985), and Air Wisconsin (1987).

- Table 20 - Includes only aircraft with 60 seats or less.
- Table 26 - Includes the rotorcraft fleet and hours flown shown in Tables 21 and 23.

TABLE 1

U.S. SHORT-TERM ECONOMIC FORECASTS

ECONOMIC VARIABLE	FISCAL YEAR 1995				FISCAL YEAR 1996			
	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH QTR.	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.
REAL GDP (1987 $)								
DRI/McGRAW-HILL	5,409.6	5,451.8	5,467.9	5,482.3	5,500.0	5,522.9	5,545.2	5,582.4
EVANS ECONOMETRICS	5,411.5	5,432.0	5,451.8	5,482.4	5,522.6	5,558.3	5,596.8	5,643.5
THE WEFA GROUP	5,413.1	5,450.4	5,483.2	5,519.4	5,552.5	5,588.6	5,623.2	5,655.6
OMB	5,408.0	5,443.5	5,470.5	5,501.0	5,536.3	5,570.5	5,604.9	5,639.5
OIL AND GAS DEFLATOR (1987 EQUALS 100)								
DRI/McGRAW-HILL	125.9	127.5	127.9	129.9	132.0	134.0	135.0	136.5
EVANS ECONOMETRICS	126.0	127.7	129.5	131.5	132.0	132.8	133.7	134.6
THE WEFA GROUP	126.0	127.9	127.8	130.4	132.0	131.2	132.9	137.9
OMB	117.9	118.7	119.6	120.5	121.4	122.3	124.1	124.1
CONSUMER PRICE INDEX (1982-84 EQUALS 100)								
DRI/McGRAW-HILL	149.9	151.2	152.3	153.5	154.8	156.0	157.2	158.5
EVANS ECONOMETRICS	149.9	151.0	152.1	153.3	154.5	155.7	156.8	158.0
THE WEFA GROUP	149.9	150.9	152.1	153.2	154.4	155.4	156.7	158.0
OMB	149.8	151.1	152.3	153.5	154.7	155.9	157.2	158.4

Source: DRI/McGraw-Hill, Inc., November 1994; Evans Economics, October 1994; The WEFA Group, November 1994; and OMB, December 1994.

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS (1995-2000) AND CONSENSUS (2001-2005)

FISCAL YEAR	GROSS DOMESTIC PRODUCT (Billions 1987$)	CONSUMER PRICE INDEX (1982-84 = 100)	OIL AND GAS DEFLATOR (1987 = 100)
Historical			
1989	4818.8	122.7	108.0
1990	4894.7	129.0	121.8
1991	4858.3	134.8	124.3
1992	4939.1	137.2	123.5
1993	5095.2	141.2	124.7
1994E	5289.6	144.7	121.5
Forecast			
1995	5455.8	149.0	119.2
1996	5587.8	153.8	122.8
1997	5727.1	158.7	126.4
1998	5869.8	163.8	130.2
1999	6015.8	168.9	134.1
2000	6165.2	174.2	138.2
2001	6321.0	180.7	144.2
2002	6477.5	187.6	150.7
2003	6635.8	194.8	157.6
2004	6799.3	202.2	164.6
2005	6969.9	210.1	171.7
2006	7143.8	218.2	178.9

Source: 1995-2000; Office of Management and Budget, December 1994

2001-2006; Consensus forecast based on average growth rates of DRI/McGraw-Hill, Evans, and WEFA forecasts (See Table 3), adjusted to fiscal year basis.

TABLE 3

ALTERNATIVE U.S. LONG-TERM ECONOMIC FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (Billions 1987$)			CONSUMER PRICE INDEX (1982-84 = 100)			FUEL PRICE INDEX (1982 = 100)		
	DRI	EVANS	WEFA	DRI	EVANS	WEFA	DRI	EVANS	WEFA
Historical									
1989	4,838.1	4,838.1	4,838.1	124.0	124.0	124.0	110.3	110.3	110.3
1990	4,897.7	4,897.3	4,897.3	130.7	130.8	130.7	125.7	123.9	125.7
1991	5,134.5	5,134.5	4,861.4	136.3	136.2	136.3	123.8	123.9	123.8
1992	4,986.2	4,986.2	4,986.2	140.5	140.4	140.4	123.3	123.3	123.3
1993	5,134.5	5,134.5	5,134.5	144.6	144.6	144.6	122.2	122.2	122.2
1994E	5,332.9	5,333.0	5,330.5	148.4	148.3	148.4	122.8	120.3	119.7
Forecast									
1995	5,461.8	5,434.5	5,470.7	153.2	152.8	153.3	128.9	123.4	120.3
1996	5,575.7	5,559.8	5,619.8	158.4	157.5	158.7	135.9	126.5	126.7
1997	4,741.0	5,699.3	5,749.7	163.8	162.8	164.3	141.9	129.7	137.1
1998	5,871.0	5,838.4	5,880.7	169.6	168.5	170.0	148.1	132.8	146.3
1999	5,998.0	5,985.8	6,024.8	175.7	174.5	176.0	154.4	136.0	155.0
2000	6,143.0	6,145.1	6,170.4	182.1	181.0	182.3	161.0	140.6	162.5
2001	6,292.0	6,311.1	6,316.0	188.9	188.3	188.9	168.7	146.2	170.0
2002	6,428.0	6,481.8	6,469.0	196.2	195.9	195.8	177.4	152.1	177.9
2003	6,560.0	6,656.1	6,632.2	203.9	204.0	202.7	186.6	158.1	186.1
2004	6,700.0	6,835.8	6,801.2	212.1	212.4	209.5	196.1	163.6	194.7
2005	6,855.0	7,020.4	6,973.3	220.8	221.2	216.6	205.2	169.4	203.7
2006	7,013.6	7,209.9	7,142.7	229.9	230.4	224.2	214.7	175.3	213.1

Source: DRI/McGraw-Hill, November, 1994; Evans Economics, Inc., October 1994; and The WEFA Group, November 1994

* Extrapolated to 2006 for forecast purposes

TABLE 4

INTERNATIONAL GDP FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 1985 U.S. Dollars) EUROPE/ AFRICA/ MIDDLE EAST	LATIN AMERICA	JAPAN/ PACIFIC BASIN/ AUSTRALIA/N. ZEALAND	WORLD
Historical*				
1989	4,573.2	935.1	2,359.0	15,644.4
1990	4,809.9	940.1	2,481.9	15,895.6
1991	4,850.4	975.4	2,591.7	15,827.3
1992	4,935.5	1,004.0	2,651.9	15,861.0
1993	4,967.6	1,037.8	2,703.5	16,040.1
1994E	5,093.1	1,068.7	2,780.9	16,369.4
Forecast				
1995	5,275.3	1,113.2	2,884.5	16,928.3
1996	5,460.6	1,170.5	3,008.1	17,590.5
1997	5,649.2	1,238.1	3,159.6	18,295.4
1998	5,849.5	1,310.5	3,316.1	19,023.9
1999	6,057.8	1,380.1	3,466.0	19,774.8
2000	6,232.1	1,440.8	3,605.3	20,546.0
2001	6,411.7	1,504.2	3,751.1	21,347.3
2002	6,596.7	1,570.4	3,903.8	22,179.9
2003	6,787.2	1,639.5	4,063.5	23,044.9
2004	6,983.4	1,711.6	4,230.8	23,943.6
2005	7,185.6	1,787.0	4,406.1	24,877.4
2006	7,393.9	1,865.6	4,589.7	25,847.6

Source: The WEFA Group, World Economic Outlook, October 1991

TABLE 5

INTERNATIONAL EXCHANGE RATE FORECASTS

CALENDAR YEAR	FOREIGN EXCHANGE RATES (US$/Local Currency, End of Year) UNITED KINGDOM	WEST*/UNITED GERMANY	JAPAN	UNITED STATES EFFECTIVE EXCHANGE RATE (1985 EQUALS 100)
Historical*				
1989	1.605	0.589	6.971	70.8
1990	1.928	0.669	7.440	66.1
1991	1.871	0.660	7.987	65.9
1992	1.512	0.620	8.016	64.6
1993	1.481	0.579	8.941	68.2
1994E	1.524	0.610	9.524	67.8
Forecast				
1995	1.411	0.556	8.511	70.0
1996	1.446	0.571	8.696	71.5
1997	1.462	0.585	8.850	70.3
1998	1.476	0.595	9.091	69.4
1999	1.479	0.599	9.174	68.8
2000	1.436	0.592	9.390	69.1
2001	1.394	0.585	9.611	69.4
2002	1.354	0.578	9.837	69.6
2003	1.315	0.571	10.069	69.9
2004	1.276	0.564	10.306	70.2
2005	1.239	0.557	10.549	70.5
2006	1.203	0.550	10.798	70.7

Source: The WEFA Group, World Economic Outlook, October 1992

TABLE 6

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

TOTAL SYSTEM OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1994 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1994 $ (Cents)
Historical*						
1989	168.8	948.4	12.43	14.67	56.4	66.6
1990	169.0	976.0	12.61	14.14	67.6	75.9
1991	167.8	986.8	12.83	13.78	79.4	85.2
1992	168.3	1,005.0	12.53	13.21	64.5	68.0
1993	166.2	1,008.7	13.05	13.37	61.9	61.9
1994E	162.9	983.8	12.73	12.73	56.5	56.5
Forecast						
1995	162	977	12.79	12.42	55.4	53.8
1996	162	974	12.85	12.09	57.1	53.7
1997	163	971	12.92	11.78	58.7	53.6
1998	164	978	13.20	11.66	60.5	53.4
1999	167	985	13.48	11.54	62.3	53.4
2000	169	991	13.77	11.44	64.2	53.3
2001	171	997	14.08	11.28	67.2	53.7
2002	173	1,003	14.43	11.12	70.1	54.1
2003	175	1,009	14.76	10.96	73.4	54.5
2004	178	1,016	15.11	10.81	76.7	54.8
2005	180	1,022	15.49	10.66	79.9	55.0
2006	182	1,029	15.87	10.51	83.4	55.2

* Source: RSPA, Form 41

TABLE 7

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1994 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1994 $ (Cents)
Historical*						
1989	152.0	790.2	13.07	15.43	55.39	65.37
1990	151.7	799.7	13.26	14.87	66.75	74.87
1991	151.0	807.0	13.31	14.29	76.57	82.19
1992	150.5	805.9	12.89	13.59	62.72	66.15
1993	149.7	803.2	13.67	14.01	60.00	61.49
1994E	146.5	786.9	13.31	13.31	54.71	54.71
Forecast						
1995	146	781	13.31	12.93	53.67	52.13
1996	145	777	13.31	12.52	55.30	52.02
1997	146	772	13.31	12.14	56.92	51.90
1998	147	774	13.58	12.00	58.63	51.79
1999	149	776	13.84	11.86	60.38	51.73
2000	151	778	14.12	11.73	62.23	51.69
2001	153	780	14.40	11.53	64.98	52.03
2002	155	782	14.70	11.33	67.95	52.38
2003	157	784	14.98	11.12	71.10	52.79
2004	159	786	15.27	10.92	74.30	53.12
2005	161	788	15.59	10.73	77.49	53.35
2006	163	790	15.90	10.53	80.83	53.53

* Source: RSPA, Form 41

TABLE 8

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 1)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1994 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1994 $ (Cents)
Historical*						
1989	275.8	2,734.5	10.36	12.23	59.9	70.7
1990	273.3	2,786.2	10.68	11.99	70.5	79.1
1991	262.8	2,856.4	11.43	12.27	87.7	94.1
1992	255.9	3,016.5	11.55	12.18	69.6	73.4
1993	242.3	2,981.9	11.45	11.73	67.5	69.2
1994E	241.8	2,990.8	11.17	11.17	61.5	61.5
Forecast						
1995	241	2,995	11.38	11.05	60.3	58.6
1996	241	2,999	11.64	10.95	62.1	58.5
1997	241	3,002	11.90	10.85	63.9	58.3
1998	242	3,004	12.23	10.80	65.9	58.2
1999	243	3,010	12.55	10.75	67.9	58.1
2000	245	3,011	12.90	10.71	69.9	58.1
2001	246	3,011	13.33	10.67	73.0	58.5
2002	248	3,011	13.79	10.63	76.4	58.9
2003	248	3,013	14.26	10.59	79.9	59.3
2004	249	3,014	14.75	10.55	83.5	59.7
2005	249	3,015	15.26	10.51	87.1	59.9
2006	250	3,016	15.80	10.46	90.8	60.2

* Source: RSPA, Form 41

TABLE 9

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 2)

	AVERAGE SEATS PER AIRCRAFT			REVENUE PER PASSENGER MILE					
				ATLANTIC		LATIN AMERICA		PACIFIC	
FISCAL YEAR	ATLANTIC (Seats)	LATIN AMERICA (Seats)	PACIFIC (Seats)	CURRENT $ (Cents)	FY 1994 $ (Cents)	CURRENT $ (Cents)	FY 1994 $ (Cents)	CURRENT $ (Cents)	FY 1994 $ (Cents)
Historical*									
1989	290.3	203.6	302.9	8.97	10.59	11.59	13.68	11.74	13.86
1990	278.6	194.0	318.6	9.56	10.72	12.01	13.47	11.55	12.96
1991	257.7	187.0	321.9	9.98	10.71	12.43	13.34	12.48	13.40
1992	245.2	182.8	320.2	9.89	10.43	13.35	14.08	12.77	13.47
1993	230.2	179.1	315.4	9.38	9.61	13.66	14.00	13.00	13.32
1994E	231.0	176.6	318.5	9.25	9.25	14.00	14.00	12.34	12.34
Forecast									
1995	231	175	319	9.38	9.11	14.34	13.93	12.58	12.22
1996	231	174	319	9.59	9.02	14.73	13.86	12.86	12.09
1997	232	173	320	9.79	8.93	15.13	13.79	13.13	11.97
1998	233	173	321	10.06	8.89	15.53	13.72	13.49	11.91
1999	234	174	322	10.32	8.84	15.94	13.65	13.84	11.85
2000	236	175	322	10.59	8.80	16.35	13.59	14.20	11.79
2001	238	176	323	10.93	8.75	16.88	13.52	14.66	11.74
2002	240	177	324	11.30	8.71	17.45	13.45	15.15	11.68
2003	240	178	324	11.67	8.67	18.03	13.38	15.65	11.62
2004	240	179	325	12.06	8.62	18.63	13.32	16.17	11.56
2005	240	180	325	12.46	8.58	19.25	13.25	16.71	11.50
2006	240	181	325	12.89	8.54	19.91	13.18	17.28	11.45

* Source: RSPA, Form 41

TABLE 10

UNITED STATES COMMERCIAL AIR CARRIERS AND REGIONALS/COMMUTERS

TOTAL SCHEDULED PASSENGER TRAFFIC [1/]

	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1989	443.6	36.8	480.4	333.2	100.6	433.8
1990	456.6	41.3	497.9	344.8	115.1	459.9
1991	445.7	39.7	485.4	339.3	113.5	452.8
1992	463.0	42.6	505.6	353.0	128.5	481.5
1993	468.1	45.2	513.3	355.8	134.8	490.6
1994E	509.0	46.3	555.3	379.1	138.5	517.6
Forecast						
1995	541.6	48.6	590.2	400.2	145.4	545.6
1996	573.9	51.6	625.5	421.9	154.6	576.5
1997	607.2	54.9	662.1	443.6	164.9	608.3
1998	633.4	58.6	692.0	463.2	175.8	639.0
1999	658.8	62.2	721.0	482.4	187.2	669.6
2000	683.5	65.7	749.2	501.0	198.1	699.1
2001	708.4	69.5	777.9	519.8	209.3	729.1
2002	733.7	73.4	807.1	538.6	220.9	759.5
2003	759.9	77.3	837.2	558.2	233.0	791.2
2004	786.0	81.5	867.5	577.9	245.6	823.5
2005	812.0	85.9	897.9	597.7	259.1	856.8
2006	838.8	90.6	929.4	618.1	273.1	891.2

* Source: RSPA, Forms 41 and 298-C

1/ Sum of Table's 11 and 19 less duplicated traffic.

TABLE 11

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions) DOMESTIC	INTERNATIONAL	TOTAL	REVENUE PASSENGER MILES (Billions) DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1989	415.6	36.8	452.4	328.4	100.6	429.1
1990	424.1	41.3	465.4	339.2	115.1	454.3
1991	413.3	39.7	453.1	333.6	113.5	447.1
1992	430.3	42.6	472.9	346.7	128.5	475.2
1993	434.0	45.2	479.2	348.6	134.8	483.4
1994E	472.0	46.3	518.3	371.4	138.5	509.9
Forecast						
1995	501.0	48.6	549.6	391.5	145.4	536.9
1996	530.3	51.6	581.9	412.2	154.6	566.8
1997	560.4	54.9	615.3	432.8	164.9	597.7
1998	583.0	58.6	641.6	451.4	175.8	627.2
1999	604.7	62.2	666.9	469.5	187.2	656.7
2000	625.5	65.7	691.2	486.9	198.1	685.0
2001	646.3	69.5	715.8	504.4	209.3	713.7
2002	667.2	73.4	740.6	522.0	220.9	742.9
2003	688.8	77.3	766.1	540.3	233.0	773.3
2004	710.5	81.5	792.0	558.7	245.6	804.3
2005	732.0	85.9	817.9	577.1	259.1	836.2
2006	754.3	90.6	844.9	596.2	273.1	869.3

* Source: RSPA, Form 41

TABLE 12

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED INTERNATIONAL PASSENGER TRAFFIC

	REVENUE PASSENGER ENPLANEMENTS (MIL)				REVENUE PASSENGER MILES (BIL)			
FISCAL YEAR	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL
Historical*								
1989	15.0	11.8	10.0	36.8	49.1	14.7	36.8	100.6
1990	16.1	13.0	12.2	41.3	53.7	16.0	45.4	115.1
1991	12.2	14.7	12.8	39.7	47.1	18.3	48.1	113.5
1992	14.8	13.6	14.2	42.6	57.7	17.1	53.6	128.5
1993	15.7	15.8	13.6	45.2	61.5	20.8	52.4	134.8
1994E	16.5	16.4	13.4	46.3	64.1	22.0	52.4	138.5
Forecast								
1995	17.4	17.3	13.9	48.6	67.6	23.4	54.4	145.4
1996	18.5	18.4	14.7	51.6	72.0	24.9	57.7	154.6
1997	19.7	19.6	15.6	54.9	76.7	26.7	61.5	164.9
1998	20.9	21.0	16.7	58.6	81.5	28.6	65.7	175.8
1999	22.1	22.3	17.8	62.2	86.5	30.4	70.3	187.2
2000	23.2	23.6	18.9	65.7	90.8	32.4	74.9	198.1
2001	24.3	25.1	20.1	69.5	95.2	34.6	79.5	209.3
2002	25.5	26.6	21.3	73.4	99.8	36.6	84.5	220.9
2003	26.6	28.1	22.6	77.3	104.5	38.8	89.7	233.0
2004	27.8	29.7	24.0	81.5	109.3	41.1	95.2	245.6
2005	29.1	31.4	25.4	85.9	114.4	43.5	101.2	259.1
2006	30.4	33.2	27.0	90.6	119.6	46.1	107.4	273.1

* Source: RSPA, Form 41

TABLE 13

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS

	DOMESTIC			INTERNATIONAL		
FISCAL YEAR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*						
1989	529.5	328.4	62.0	151.1	100.6	66.6
1990	557.6	339.2	60.8	166.2	115.1	69.2
1991	548.4	333.6	60.8	169.3	113.5	67.0
1992	554.1	346.7	62.6	191.6	128.5	67.1
1993	568.8	348.6	61.3	199.5	134.8	67.6
1994E	578.0	371.4	64.3	197.3	138.5	70.2
Forecast						
1995	602.2	391.5	65.0	207.6	145.4	70.1
1996	629.3	412.2	65.5	220.4	154.6	70.2
1997	655.8	432.8	66.0	234.6	164.9	70.3
1998	684.0	451.4	66.0	249.9	175.8	70.4
1999	716.8	469.5	65.5	266.1	187.2	70.4
2000	749.0	486.9	65.0	281.6	198.1	70.4
2001	782.0	504.4	64.5	297.6	209.3	70.3
2002	815.7	522.0	64.0	314.1	220.9	70.3
2003	844.2	540.3	64.0	331.4	233.0	70.3
2004	872.9	558.7	64.0	349.4	245.6	70.3
2005	901.7	577.1	64.0	368.4	259.1	70.3
2006	931.5	596.2	64.0	388.5	273.1	70.3

* Source: RSPA, Form 41

TABLE 14

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS BY INTERNATIONAL TRAVEL REGIONS

	ATLANTIC			LATIN AMERICA			PACIFIC		
FISCAL YEAR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*									
1989	74.8	49.1	65.7	23.7	14.7	61.9	52.6	36.8	70.1
1990	77.0	53.7	69.8	25.7	16.0	62.3	63.6	45.4	71.4
1991	67.8	47.1	69.5	29.4	18.3	62.3	72.1	48.1	66.7
1992	83.8	57.7	68.9	29.4	17.1	58.3	78.4	53.6	68.4
1993	88.7	61.5	69.4	35.9	20.8	57.9	74.9	52.4	70.1
1994E	88.5	64.1	72.3	36.2	22.1	60.9	72.6	52.4	72.1
Forecast									
1995	93.9	67.6	72.0	38.1	23.4	61.5	75.6	54.4	72.0
1996	100.0	72.0	72.0	40.2	24.9	62.0	80.2	57.7	72.0
1997	106.5	76.7	72.0	42.7	26.7	62.5	85.4	61.5	72.0
1998	113.2	81.5	72.0	45.4	28.6	63.0	91.3	65.7	72.0
1999	120.1	86.5	72.0	48.3	30.4	63.0	97.7	70.3	72.0
2000	126.1	90.8	72.0	51.5	32.4	63.0	104.0	74.9	72.0
2001	132.3	95.3	72.0	54.9	34.6	63.0	110.4	79.5	72.0
2002	138.7	99.8	72.0	58.1	36.6	63.0	117.3	84.5	72.0
2003	145.2	104.5	72.0	61.6	38.8	63.0	124.6	89.7	72.0
2004	151.9	109.3	72.0	65.2	41.1	63.0	132.3	95.2	72.0
2005	158.8	114.4	72.0	69.1	43.5	63.0	140.5	101.2	72.0
2006	166.2	119.6	72.0	73.1	46.1	63.0	149.2	107.4	72.0

* Source: RSPA, Form 41

TABLE 15

UNITED STATES COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT

AS OF JANUARY 1	NARROWBODY			WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1989	1,764	1,191	257	187	300	171	3,870
1990	1,911	1,185	250	197	283	181	4,007
1991	2,113	1,194	246	210	290	191	4,244
1992	2,178	1,091	208	221	309	201	4,208
1993	2,327	991	207	239	330	169	4,263
1994E	2,526	935	217	263	315	170	4,426
Forecast							
1995	2,688	845	205	262	300	174	4,474
1996	2,811	809	209	272	305	176	4,582
1997	2,986	751	214	298	304	172	4,725
1998	3,190	672	220	356	287	183	4,908
1999	3,367	588	217	400	281	196	5,049
2000	3,525	532	209	442	279	209	5,196
2001	3,715	515	213	481	267	213	5,404
2002	3,904	507	217	517	257	219	5,621
2003	4,112	500	222	547	249	223	5,853
2004	4,302	491	226	589	243	229	6,080
2005	4,489	489	231	631	235	234	6,309
2006	4,661	490	235	668	234	243	6,531

* Source: FAA Aircraft Utilization and Propulsion Reliability Report

TABLE 16

UNITED STATES COMMERCIAL AIR CARRIERS

TOTAL AIRBORNE HOURS

(In Thousands)

	NARROWBODY			WIDEBODY			
FISCAL YEAR	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL
Historical*							
1989	4,691	2,704	546	655	939	641	10,176
1990	5,138	2,589	421	698	946	665	10,457
1991	5,481	2,262	345	743	909	645	10,385
1992	5,894	2,034	247	825	1,006	579	10,585
1993	6,407	1,899	267	931	1,027	529	11,050
1994E	6,971	1,626	224	958	907	515	11,201
Forecast							
1995	7,418	1,436	211	969	810	525	11,369
1996	7,757	1,334	216	1,020	793	535	11,655
1997	8,240	1,201	220	1,134	790	524	12,109
1998	8,803	1,041	227	1,352	746	558	12,727
1999	9,427	882	222	1,532	730	599	13,392
2000	9,870	771	214	1,692	725	642	13,914
2001	10,402	721	218	1,847	694	656	14,538
2002	10,931	659	222	1,990	668	675	15,145
2003	11,513	625	228	2,105	647	687	15,805
2004	12,045	589	231	2,267	631	707	16,470
2005	12,569	538	237	2,429	611	723	17,107
2006	13,050	539	240	2,571	609	750	17,759

* Source: RSPA, Form 41

TABLE 17

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

UNITED STATES CIVIL AVIATION AIRCRAFT

(In Millions of Gallons)

FISCAL YEAR	JET FUEL					AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS			GENERAL AVIATION	TOTAL	AIR CARRIER	GENERAL AVIATION	TOTAL	
	DOMESTIC	INT'L.	TOTAL						
Historical*									
1989	12,087	3,537	15,624	613	16,237	3	361	364	16,601
1990	12,439	3,812	16,251	533	16,784	3	365	368	17,151
1991	11,657	3,998	15,655	487	16,142	2	343	345	16,487
1992	11,704	4,065	15,769	435	16,204	2	297	299	16,502
1993	11,899	4,109	16,008	451	16,459	2	268	270	16,729
1994E	12,202	4,227	16,429	451	16,880	2	264	266	17,146
Forecast									
1995	12,624	4,417	17,041	473	17,514	2	265	267	17,781
1996	13,137	4,659	17,796	495	18,291	2	265	267	18,558
1997	13,634	4,928	18,562	518	19,080	2	268	270	19,350
1998	14,161	5,217	19,378	541	19,919	2	268	270	20,189
1999	14,779	5,520	20,299	563	20,862	2	271	273	21,135
2000	15,379	5,806	21,185	585	21,770	2	272	274	22,044
2001	15,911	6,098	22,009	608	22,617	2	273	275	22,892
2002	16,609	6,397	23,006	630	23,636	2	274	276	23,912
2003	17,123	6,708	23,831	655	24,486	2	274	276	24,762
2004	17,634	7,030	24,664	682	25,346	2	274	276	25,622
2005	18,142	7,368	25,510	702	26,212	2	274	276	26,488
2006	18,667	7,723	26,390	729	27,119	2	273	275	27,394

* Source: Air carrier jet fuel, RSPA Form 41; All others, FAA APO estimates

TABLE 18

BASELINE REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH 48 STATES (Miles)	HA/P.R./V.I. (Miles)	AVERAGE PASSENGER LOAD FACTOR (Percent)
Historical*				
1989	20.4	179.3	89.8	47.8
1990	20.8	183.5	82.8	47.1
1991	21.5	185.7	82.0	46.8
1992	22.9	196.9	85.8	48.1
1993	23.0	204.2	88.6	48.5
1994E	23.7	211.0	89.3	50.4
Forecast				
1995	24.1	216.0	91.0	50.7
1996	25.4	221.0	91.2	51.0
1997	26.3	225.0	91.4	51.2
1998	27.5	229.0	91.4	51.4
1999	28.4	232.0	91.5	51.5
2000	29.3	235.0	91.5	51.7
2001	30.2	238.0	91.6	51.8
2002	31.2	240.0	91.6	51.8
2003	32.1	242.0	91.6	51.9
2004	33.1	244.0	91.7	52.0
2005	34.0	246.0	91.7	52.1
2006	34.9	248.0	91.8	52.2

* Source: RSPA, Form's 298-C and 41

TABLE 19

UNITED STATES REGIONALS/COMMUTERS

SCHEDULED PASSENGER TRAFFIC

(In Millions)

	REVENUE PASSENGER ENPLANEMENTS			REVENUE PASSENGER MILES		
FISCAL YEAR	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL
Historical*						
1989	30.7	1.4	32.1	5,504.8	125.3	5,630.1
1990	35.5	1.7	37.2	6,513.1	140.7	6,653.8
1991	37.0	1.7	38.7	6,870.1	139.4	7,009.5
1992	41.1	1.6	42.7	8,091.7	137.2	8,228.9
1993	45.1	1.6	46.7	9,208.5	141.7	9,350.2
1994E	52.0	1.6	53.6	10,972.0	142.9	11,114.9
Forecast						
1995	56.7	1.7	58.4	12,247.2	154.7	12,401.9
1996	60.9	1.7	62.6	13,458.9	155.0	13,613.9
1997	65.3	1.7	67.0	14,692.5	155.4	14,847.9
1998	69.9	1.8	71.7	16,007.1	164.5	16,171.6
1999	74.7	1.8	76.5	17,330.4	164.7	17,495.1
2000	79.6	1.9	81.5	18,706.0	173.8	18,879.8
2001	84.8	1.9	86.7	20,182.4	174.0	20,356.4
2002	90.3	2.0	92.3	21,672.0	183.2	21,855.2
2003	96.0	2.1	98.1	23,232.0	192.4	23,424.4
2004	101.6	2.1	103.7	24,790.4	192.6	24,983.0
2005	107.2	2.2	109.4	26,371.2	201.7	26,572.9
2006	112.9	2.2	115.1	27,999.2	202.0	28,201.2

* Source: RSPA, Form's 298-C and 41

TABLE 20

UNITED STATES REGIONALS/COMMUTERS

PASSENGER AIRCRAFT AND FLIGHT HOURS

AS OF JANUARY 1	LESS THAN 15 SEATS	15 TO 19 SEATS	20 TO 40 SEATS	MORE THAN 40 SEATS	TOTAL	FLIGHT HOURS (000)
Historical						
1989	538	802	303	139	1,782	2,454
1990	541	762	366	150	1,819	2,725
1991	535	762	445	154	1,896	2,720
1992	534	735	503	188	1,960	2,837
1993	530	752	585	187	2,054	2,935
1994E	581	763	626	209	2,179	2,986
Forecast						
1995	565	774	685	260	2,284	3,108
1996	535	783	761	317	2,396	3,227
1997	498	795	844	359	2,496	3,345
1998	473	786	910	427	2,596	3,464
1999	454	780	973	488	2,695	3,586
2000	437	776	1,019	550	2,782	3,708
2001	423	762	1,065	625	2,875	3,835
2002	405	754	1,105	692	2,956	3,968
2003	392	741	1,159	742	3,034	4,103
2004	380	722	1,204	803	3,109	4,247
2005	372	703	1,255	851	3,181	4,391
2006	357	688	1,313	892	3,250	4,540

Source: Fleet, FAA Aircraft Utilization and Propulsion Reliability Report
Flight Hours, RSPA Form 298-C

TABLE 21

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

(In Thousands)

AS OF JANUARY 1	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON								
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE			
Historical*									
1989	153.7	20.9	4.6	3.9	2.4	3.5	N.A.	6.4	195.4
1990	158.7	21.4	5.2	4.0	3.0	4.0	N.A.	7.1	203.4
1991	153.8	20.9	4.9	4.1	3.2	3.6	N.A.	6.6	197.1
1992	153.9	21.1	4.6	4.3	2.5	3.8	N.A.	7.5	197.8
1993	143.4	18.2	4.5	3.9	2.2	3.5	N.A.	7.9	183.6
1994	130.7	16.4	4.4	3.9	1.6	2.9	10.9**	5.2	176.0
Forecast									
1995	128.1	16.2	4.5	4.0	1.6	3.0	11.1	5.3	173.8
1996	125.5	15.9	4.7	4.2	1.6	3.1	11.3	5.4	171.7
1997	123.6	15.8	4.9	4.4	1.5	3.2	11.5	5.5	170.4
1998	122.4	15.6	5.0	4.5	1.5	3.3	11.7	5.6	169.6
1999	122.4	15.6	5.1	4.6	1.5	3.4	11.8	5.7	170.1
2000	122.4	15.6	5.2	4.7	1.5	3.5	12.0	5.8	170.7
2001	122.4	15.7	5.3	4.8	1.5	3.6	12.2	5.9	171.4
2002	122.4	15.7	5.4	4.9	1.5	3.7	12.4	6.0	172.0
2003	122.4	15.8	5.5	5.0	1.5	3.8	12.6	6.1	172.7
2004	122.4	15.9	5.6	5.1	1.5	3.9	12.8	6.2	173.4
2005	122.4	15.9	5.7	5.2	1.5	4.0	13.0	6.3	174.0
2006	122.4	16.0	5.8	5.3	1.5	4.1	13.1	6.4	174.6

* Source: FAA General Aviation and Air Taxi Surveys

** First year reported in Survey.

Notes: Detail may not add to total because of independent rounding.
An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 22

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

BY FAA REGION

(In Thousands)

AS OF JANUARY 1	FAA REGION									
	ANE	AEA	ASO	AGL	ACE	ASW	AWP	ANM	AAL	TOTAL
Historical*										
1989	8.9	22.3	32.2	34.8	11.3	27.4	34.2	18.5	5.9	195.4
1990	8.7	23.5	34.3	36.6	11.1	28.8	35.1	20.1	6.1	203.4
1991	8.1	23.0	32.7	34.7	11.0	26.4	34.7	20.3	6.5	197.1
1992	8.3	22.5	32.4	34.8	11.4	26.5	36.5	19.4	6.6	197.8
1993	7.2	21.7	30.8	32.9	10.3	24.9	31.4	19.2	6.1	183.6
1994E	7.2	21.2	28.5	32.4	10.5	22.9	29.6	18.3	5.4	176.0
Forecast										
1995	7.0	21.0	28.3	32.0	10.4	22.5	29.0	18.2	5.4	173.8
1996	6.9	20.7	28.0	31.3	10.2	22.3	28.8	18.1	5.4	171.7
1997	6.9	20.6	27.8	30.7	10.0	22.2	28.7	18.1	5.4	170.4
1998	6.8	20.5	27.8	30.2	9.9	22.1	28.7	18.2	5.4	169.6
1999	6.9	20.4	28.1	30.0	9.9	22.3	28.8	18.3	5.4	170.1
2000	6.9	20.5	28.2	30.0	9.9	22.4	28.9	18.4	5.5	170.7
2001	7.0	20.5	28.5	30.1	9.9	22.4	29.0	18.5	5.5	171.4
2002	7.0	20.6	28.7	30.2	9.9	22.5	29.0	18.6	5.5	172.0
2003	7.1	20.7	28.8	30.2	9.9	22.6	29.1	18.7	5.6	172.7
2004	7.1	20.7	29.0	30.3	10.0	22.8	29.2	18.7	5.6	173.4
2005	7.2	20.8	29.2	30.3	10.0	22.9	29.2	18.8	5.6	174.0
2006	7.2	20.8	29.4	30.4	10.0	23.0	29.3	18.9	5.6	174.6

Source: FAA Statistical Handbook of Aviation.

* Adjusted to reflect nonrespondent sampling error.

Notes: History does not add up before 1994 because air taxi adjustments are not available by region. Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 23

ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

(In Millions)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON								
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE			
Historical*									
1989	20.5	4.0	1.9	1.5	0.7	1.9	N.A.	0.4	30.9
1990	21.7	3.7	1.5	1.4	0.7	1.4	N.A.	0.3	30.7
1991	20.4	3.4	1.2	1.2	0.6	2.2	N.A.	0.5	29.5
1992	18.0	2.9	1.2	1.1	0.4	1.8	N.A.	0.4	25.8
1993	16.5	2.5	1.2	1.2	0.4	1.5	0.7**	0.4	24.4
1994E	16.2	2.5	1.2	1.2	0.4	1.5	0.7	0.4	24.1
Forecast									
1995	16.2	2.5	1.3	1.2	0.4	1.6	0.7	0.4	24.3
1996	16.2	2.5	1.4	1.3	0.4	1.7	0.7	0.4	24.6
1997	16.2	2.6	1.5	1.4	0.4	1.7	0.8	0.4	25.0
1998	16.2	2.6	1.5	1.5	0.4	1.8	0.8	0.4	25.2
1999	16.3	2.7	1.6	1.5	0.4	1.9	0.8	0.4	25.6
2000	16.3	2.7	1.7	1.6	0.4	2.0	0.8	0.4	25.9
2001	16.2	2.7	1.7	1.7	0.4	2.1	0.8	0.5	26.1
2002	16.1	2.7	1.8	1.7	0.4	2.2	0.9	0.5	26.3
2003	16.0	2.8	1.8	1.8	0.4	2.2	0.9	0.5	26.4
2004	15.9	2.8	1.9	1.9	0.4	2.3	0.9	0.5	26.6
2005	15.7	2.9	2.0	1.9	0.4	2.4	1.0	0.5	26.8
2006	15.6	2.9	2.1	2.0	0.4	2.5	1.0	0.5	27.0

* Source: FAA General Aviation and Air Taxi Surveys

** First year reported in Survey.

Notes: Detail may not add to total because of independent rounding.
An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 24

ACTIVE PILOTS BY TYPE OF CERTIFICATE
(In Thousands)

AS OF JANUARY 1	STUDENTS	RECREATIONAL[2] LIGHTER-THAN-AIR[3]	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	HELICOPTER	GLIDER	TOTAL	INSTRUMENT RATED[1]
Historical*									
1989	136.9	1.1	299.8	143.0	97.0	8.6	7.6	694.0	273.8
1990	142.5	1.1	293.2	144.5	102.1	8.9	7.7	700.0	282.8
1991	128.7	0.1	299.1	149.7	107.7	9.6	7.8	702.7	297.1
1992	120.2	0.2	293.3	148.4	112.2	9.9	8.0	692.1	303.2
1993	114.6	0.2	288.1	146.4	115.9	9.7	8.2	683.0	306.2
1994E	103.6	0.2	283.7	143.0	117.1	9.2	8.3	665.1	305.5
Forecast									
1995	103.9	0.3	284.6	144.4	118.2	9.2	8.5	669.1	308.6
1996	104.9	0.3	285.4	145.9	120.0	9.3	8.6	674.4	311.7
1997	106.0	0.4	286.3	147.4	122.4	9.4	8.6	680.5	315.7
1998	107.6	0.5	287.1	148.9	125.5	9.4	8.7	687.7	320.1
1999	109.2	0.6	288.0	150.4	128.6	9.5	8.8	695.1	324.9
2000	109.7	0.6	288.8	151.8	131.8	9.6	8.8	701.1	329.8
2001	110.3	0.7	289.6	153.4	135.1	9.7	8.9	707.7	334.4
2002	110.8	0.7	290.6	154.9	138.5	9.7	8.9	714.1	339.1
2003	111.4	0.8	291.5	156.4	141.3	9.8	9.0	720.2	343.2
2004	111.9	0.9	292.3	158.0	144.1	9.8	9.0	726.0	347.3
2005	112.5	1.0	293.2	159.6	147.0	9.9	9.1	732.3	350.8
2006	113.1	1.0	294.1	161.2	149.9	9.9	9.1	738.3	354.3

* Source: FAA Statistical Handbook of Aviation.

1/ Instrument rated pilots should not be added to other categories in deriving total.
2/ Recreational rating not available until 1991.
3/ Lighter-than-air type rating is no longer issued after 1990.
Notes: Detail may not add to total because of independent rounding.

TABLE 25

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

(In Millions of Gallons)

	FIXED WING							
	PISTON				ROTORCRAFT		OTHER/	
CALENDAR YEAR	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE	EXPERI-MENTAL	TOTAL
Historical*								
1989	221.6	118.8	153.9	404.4	10.4	54.5	10.2	973.8
1990	233.9	111.3	120.7	371.6	10.8	40.2	8.9	897.4
1991	220.5	102.0	96.8	327.9	8.8	62.0	11.8	829.9
1992	194.0	85.6	98.0	283.7	6.3	52.9	10.7	731.1
1993	178.4	74.7	98.7	310.2	5.6	41.8	9.5	718.9
1994E	174.6	74.7	98.7	310.2	5.6	41.8	9.5	715.2
Forecast								
1995	174.5	75.0	102.7	326.6	5.6	43.5	9.7	737.6
1996	174.4	75.4	106.8	343.0	5.6	45.2	10.0	760.4
1997	175.5	76.1	111.0	360.2	5.6	47.2	10.3	786.0
1998	175.4	76.7	115.9	375.7	5.6	49.6	10.6	809.5
1999	177.1	77.8	121.0	390.7	5.6	51.6	10.8	834.6
2000	176.3	78.8	126.2	405.0	5.8	54.1	11.1	857.3
2001	175.4	80.2	131.0	420.7	5.8	56.3	11.3	880.7
2002	174.6	81.6	135.9	435.8	5.8	58.6	11.6	903.9
2003	173.8	82.7	139.6	454.3	5.8	61.0	12.0	929.2
2004	172.1	83.7	145.5	473.5	5.8	62.9	12.3	955.8
2005	170.4	84.8	149.4	487.8	5.8	64.8	12.6	975.6
2006	168.8	85.8	155.7	505.6	5.8	67.4	12.8	1,001.9

Source: FAA APO Estimates

* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding.

TABLE 26

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

AS OF JANUARY 1	ACTIVE FLEET (Thousands) PISTON	TURBINE	TOTAL	HOURS FLOWN (1) (Millions) PISTON	TURBINE	TOTAL
Historical*						
1989	2.4	3.5	5.9	0.7	1.9	2.6
1990	3.0	4.0	7.0	0.7	1.4	2.1
1991	3.2	3.6	6.8	0.6	2.2	2.8
1992	2.5	3.8	6.4	0.4	1.8	2.3
1993	2.2	3.5	5.8	0.4	1.5	1.8
1994E	1.6	2.9	4.5	0.4	1.5	1.8
Forecast						
1995	1.6	3.0	4.6	0.4	1.6	2.0
1996	1.6	3.1	4.7	0.4	1.7	2.1
1997	1.5	3.2	4.7	0.4	1.7	2.1
1998	1.5	3.3	4.8	0.4	1.8	2.2
1999	1.5	3.4	4.9	0.4	1.9	2.3
2000	1.5	3.5	5.0	0.4	2.0	2.4
2001	1.5	3.6	5.1	0.4	2.1	2.5
2002	1.5	3.7	5.2	0.4	2.2	2.6
2003	1.5	3.8	5.3	0.4	2.2	2.6
2004	1.5	3.9	5.4	0.4	2.3	2.7
2005	1.5	4.0	5.5	0.4	2.4	2.8
2006	1.5	4.1	5.6	0.4	2.5	2.9

* Source: FAA Statistical Handbook of Aviation

TABLE 27

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

	OPERATED BY FAA						CONTRACTED BY FAA	
FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF FAA TOWERS	TOTAL OPERATIONS	# OF TOWERS
Historical*								
1989	12.5	8.3	37.8	2.8	61.4	399	1.2	20
1990	12.9	8.8	39.0	2.8	63.5	403	1.5	24
1991	12.5	8.9	37.6	2.5	61.5	399	1.6	26
1992	12.4	9.3	37.0	2.8	61.5	401	1.7	27
1993	12.6	9.7	35.2	2.6	60.1	401	1.6	27
1994E	13.2	10.0	34.7	2.4	60.3	402	1.9	32
1994**	13.2	9.5	31.8	2.3	56.8	352	5.4	82
Forecast								
1995	13.6	9.9	32.9	2.2	58.6	352	5.5	82
1996	14.0	10.1	32.4	1.9	58.4	352	5.5	82
1997	14.4	10.4	32.8	1.9	59.5	352	5.6	82
1998	14.7	10.7	33.3	1.9	60.6	352	5.6	82
1999	15.0	11.0	33.8	1.9	61.7	352	5.7	82
2000	15.3	11.3	34.3	1.9	62.8	352	5.7	82
2001	15.6	11.6	34.7	1.9	63.8	352	5.8	82
2002	15.8	11.9	35.1	1.9	64.7	352	5.8	82
2003	16.0	12.2	35.4	1.9	65.5	352	5.9	82
2004	16.2	12.5	35.8	1.9	66.4	352	6.0	82
2005	16.4	12.8	36.1	1.9	67.2	352	6.0	82
2006	16.6	13.1	36.4	1.9	68.0	352	6.1	82

* Source: FAA Air Traffic Activity.
** Total for 352 towered airports.
Notes: Detail may not add to total because of rounding.

TABLE 28

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1989	12.5	8.3	22.1	1.4	44.3
1990	12.9	8.8	22.4	1.4	45.5
1991	12.5	8.9	21.5	1.3	44.2
1992	12.4	9.3	21.3	1.5	44.5
1993	12.6	9.7	20.4	1.4	44.0
1994E	13.2	10.0	20.2	1.3	44.7
1994**	13.2	9.5	18.6	1.2	42.5
Forecast					
1995	13.6	9.9	19.3	1.1	43.9
1996	14.0	10.1	19.0	1.0	44.1
1997	14.4	10.4	19.2	1.0	45.0
1998	14.7	10.7	19.5	1.0	45.9
1999	15.0	11.0	19.8	1.0	46.8
2000	15.3	11.3	20.1	1.0	47.7
2001	15.6	11.6	20.3	1.0	48.5
2002	15.8	11.9	20.5	1.0	49.2
2003	16.0	12.2	20.7	1.0	49.9
2004	16.2	12.5	20.9	1.0	50.6
2005	16.4	12.8	21.0	1.0	51.2
2006	16.6	13.1	21.2	1.0	51.9

* Source: FAA Air Traffic Activity.
** Total for 352 towered airports.
Notes: Detail may not add to total because of rounding.

TABLE 29

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1989	15.7	1.4	17.1
1990	16.6	1.4	18.0
1991	16.0	1.2	17.2
1992	15.7	1.3	17.0
1993	14.9	1.2	16.1
1994E	14.5	1.2	15.7
1994**	13.2	1.1	13.3
Forecast			
1995	13.6	1.0	14.6
1996	13.4	0.9	14.3
1997	13.6	0.9	14.5
1998	13.8	0.9	14.7
1999	14.0	0.9	14.9
2000	14.2	0.9	15.1
2001	14.4	0.9	15.3
2002	14.6	0.9	15.5
2003	14.7	0.9	15.6
2004	14.9	0.9	15.8
2005	15.1	0.9	16.0
2006	15.2	0.9	16.1

* Source: FAA Air Traffic Activity.
** Total for 352 towered airports.
Notes: Detail may not add to total because of rounding.

TABLE 30

INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	
Historical*						
1989	13.6	8.4	18.6	4.5	45.0	(9.4)
1990	14.0	9.4	19.1	4.4	46.8	(10.0)
1991	13.5	9.5	18.1	4.0	45.1	(9.5)
1992	13.4	9.9	18.2	4.1	45.6	(9.4)
1993	13.6	10.4	17.7	3.9	45.7	(9.1)
1994E	14.3	10.8	18.0	3.7	46.7	(9.2)
Forecast						
1995	14.7	11.1	18.3	3.6	47.7	(9.4)
1996	15.1	11.4	18.6	3.5	48.6	(9.4)
1997	15.5	11.7	18.9	3.5	49.6	(9.4)
1998	15.9	12.0	19.2	3.5	50.6	(9.4)
1999	16.3	12.3	19.5	3.5	51.6	(9.4)
2000	16.7	12.6	19.8	3.5	52.6	(9.4)
2001	17.1	12.9	20.0	3.5	53.5	(9.4)
2002	17.3	13.2	20.2	3.5	54.2	(9.4)
2003	17.5	13.5	20.4	3.5	54.9	(9.4)
2004	17.7	13.8	20.6	3.5	55.6	(9.4)
2005	17.9	14.1	20.8	3.5	56.3	(9.4)
2006	18.1	14.4	21.0	3.5	57.0	(9.4)

* Source: FAA Air Traffic Activity.

Notes: Non-IFR instrument counts at Terminal Control Area (TCA) facilities and expanded area radar service are included in totals and are shown in parenthesis (See Table 31). Data include instrument operations at FAA operated military radar approach control facilities.

Detail may not add because of rounding.

TABLE 31

NON-IFR INSTRUMENT OPERATIONS
(In Millions)

FISCAL YEAR	TERMINAL CONTROL AREAS	AIRPORT RADAR SERVICE AREAS	TOTAL
Historical*			
1989	1.6	7.8	9.4
1990	1.9	8.1	10.0
1991	2.5	7.0	9.5
1992	2.3	6.9	9.2
1993	2.2	6.9	9.1
1994E	2.2	7.0	9.2
Forecast			
1995	2.2	7.2	9.4
1996	2.2	7.2	9.4
1997	2.2	7.2	9.4
1998	2.2	7.2	9.4
1999	2.2	7.2	9.4
2000	2.2	7.2	9.4
2001	2.2	7.2	9.4
2002	2.2	7.2	9.4
2003	2.2	7.2	9.4
2004	2.2	7.2	9.4
2005	2.2	7.2	9.4
2006	2.2	7.2	9.4

* Source: FAA

TABLE 32

IFR AIRCRAFT HANDLED

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1989	17.5	5.2	8.2	5.7	36.6
1990	18.5	5.6	7.9	5.5	37.4
1991	18.3	5.6	7.4	5.1	36.4
1992	18.3	5.9	7.4	5.1	36.7
1993	19.0	6.2	7.4	4.8	37.5
1994E	20.0	6.5	7.7	4.6	38.8
Forecast					
1995	20.6	6.8	7.9	4.5	39.8
1996	21.2	7.0	8.1	4.4	40.7
1997	21.8	7.2	8.1	4.4	41.5
1998	22.3	7.4	8.3	4.4	42.4
1999	22.8	7.6	8.3	4.4	43.1
2000	23.3	7.9	8.5	4.4	44.1
2001	23.8	8.1	8.5	4.4	44.8
2002	24.3	8.3	8.7	4.4	45.7
2003	24.8	8.5	8.7	4.4	46.4
2004	25.3	8.7	8.9	4.4	47.3
2005	25.8	8.9	8.9	4.4	48.0
2006	26.3	9.1	9.1	4.4	48.9

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 33

IFR DEPARTURES AND OVERS

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	AIR CARRIER IFR DEPARTURES	AIR CARRIER OVERS	AIR TAXI/COMMUTER IFR DEPARTURES	AIR TAXI/COMMUTER OVERS	GENERAL AVIATION IFR DEPARTURES	GENERAL AVIATION OVERS	MILITARY IFR DEPARTURES	MILITARY OVERS	TOTAL DEPARTURES	TOTAL OVERS
Historical*										
1989	6.0	5.4	2.5	0.3	3.4	1.4	1.9	1.9	13.8	9.0
1990	6.3	5.9	2.6	0.4	3.3	1.3	1.8	1.8	14.0	9.4
1991	6.2	5.8	2.6	0.3	3.1	1.2	1.7	1.7	13.6	9.0
1992	6.3	5.9	2.7	0.4	3.1	1.3	1.8	1.8	13.9	9.4
1993	6.3	6.4	2.9	0.5	3.1	1.3	1.7	1.4	14.0	9.6
1994E	6.7	6.6	3.0	0.6	3.2	1.3	1.6	1.4	14.5	9.9
Forecast										
1995	7.0	6.6	3.1	0.6	3.3	1.3	1.6	1.3	15.0	9.8
1996	7.2	6.8	3.2	0.6	3.4	1.3	1.6	1.2	15.4	9.9
1997	7.4	7.0	3.3	0.6	3.4	1.3	1.6	1.2	15.7	10.1
1998	7.6	7.1	3.4	0.6	3.5	1.3	1.6	1.2	16.1	10.2
1999	7.8	7.2	3.5	0.6	3.5	1.3	1.6	1.2	16.4	10.3
2000	8.0	7.3	3.6	0.7	3.6	1.3	1.6	1.2	16.8	10.5
2001	8.2	7.4	3.7	0.7	3.6	1.3	1.6	1.2	17.1	10.6
2002	8.4	7.5	3.8	0.7	3.7	1.3	1.6	1.2	17.5	10.7
2003	8.6	7.6	3.9	0.7	3.7	1.3	1.6	1.2	17.8	10.8
2004	8.8	7.7	4.0	0.7	3.8	1.3	1.6	1.2	18.2	10.9
2005	9.0	7.8	4.1	0.7	3.8	1.3	1.6	1.2	18.5	11.0
2006	9.2	7.9	4.2	0.7	3.9	1.3	1.6	1.2	18.9	11.1

* Source: FAA Air Traffic Activity.

Note: Totals may not add because of rounding.

TABLE 34

TOTAL FLIGHT SERVICES

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	TOTAL FLIGHT SERVICES	FLIGHT SERVICES INCLUDING DUATS
Historical*					
1989	7.7	12.3	6.5	46.6	46.6
1990	7.3	11.8	6.3	44.6	47.6
1991	6.6	11.0	5.8	41.1	47.5
1992	6.4	10.7	5.5	39.7	48.5
1993	6.2	10.0	4.9	37.2	49.5
1994E	6.2	9.4	4.6	35.8	52.0
Forecast					
1995	6.1	9.2	4.3	34.9	48.1
1996	6.0	8.9	4.2	34.0	48.4
1997	6.0	8.7	4.2	33.6	49.0
1998	6.0	8.6	4.2	33.4	49.4
1999	5.9	8.6	4.2	33.2	50.0
2000	5.9	8.5	4.1	32.9	50.3
2001	5.8	8.5	4.1	32.7	50.7
2002	5.8	8.4	4.1	32.5	50.9
2003	5.8	8.3	4.1	32.3	51.3
2004	5.7	8.3	4.0	32.0	51.4
2005	5.7	8.2	4.0	31.8	51.6
2006	5.7	8.1	4.0	31.6	51.8

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 35

FLIGHT PLANS ORIGINATED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED IFR-DVFR	VFR	TOTAL
Historical*			
1989	5.9	1.8	7.7
1990	5.5	1.8	7.3
1991	4.9	1.7	6.6
1992	4.8	1.6	6.4
1993	4.7	1.5	6.2
1994E	4.7	1.5	6.2
Forecast			
1995	4.7	1.4	6.1
1996	4.6	1.4	6.0
1997	4.6	1.4	6.0
1998	4.6	1.4	6.0
1999	4.5	1.4	5.9
2000	4.5	1.4	5.9
2001	4.5	1.3	5.8
2002	4.5	1.3	5.8
2003	4.5	1.3	5.8
2004	4.4	1.3	5.7
2005	4.4	1.3	5.7
2006	4.4	1.3	5.7

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 36

AIRCRAFT CONTACTED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

	USER CATEGORY				FLIGHT RULES		
FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	IFR-DVFR	VFR	TOTAL
Historical*							
1989	0.3	0.9	4.9	0.4	1.9	4.5	6.5
1990	0.3	0.8	4.8	0.4	1.8	4.5	6.3
1991	0.2	0.8	4.4	0.4	1.7	4.1	5.8
1992	0.2	0.8	4.1	0.4	1.7	3.8	5.5
1993	0.2	0.7	3.7	0.3	1.5	3.4	4.9
1994E	0.2	0.7	3.5	0.2	1.4	3.2	4.6
Forecast							
1995	0.2	0.6	3.3	0.2	1.2	3.1	4.3
1996	0.1	0.6	3.3	0.2	1.1	3.1	4.2
1997	0.1	0.6	3.3	0.2	1.1	3.1	4.2
1998	0.1	0.6	3.3	0.2	1.1	3.1	4.2
1999	0.1	0.6	3.3	0.2	1.1	3.1	4.2
2000	0.1	0.5	3.3	0.2	1.0	3.1	4.1
2001	0.1	0.5	3.3	0.2	1.0	3.1	4.1
2002	0.1	0.5	3.3	0.2	1.0	3.1	4.1
2003	0.1	0.5	3.3	0.2	1.0	3.1	4.1
2004	0.1	0.5	3.2	0.2	0.9	3.1	4.0
2005	0.1	0.5	3.2	0.2	0.9	3.1	4.0
2006	0.1	0.5	3.2	0.2	0.9	3.1	4.0

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 37

AUTOMATED FLIGHT SERVICES

DUATS TRANSACTIONS

(In Millions)

FISCAL YEAR	DUATS FLIGHT PLANS	DUATS TRANSACTIONS	TOTAL DUATS
Historical*			
1989	-	-	-
1990	0.2	1.3	3.0
1991	0.5	2.7	6.4
1992	0.6	3.8	8.8
1993	0.7	5.4	12.3
1994E	0.7	7.3	16.2
Forecast			
1995	0.8	5.8	13.2
1996	1.0	6.2	14.4
1997	1.1	6.6	15.4
1998	1.2	6.8	16.0
1999	1.4	7.0	16.8
2000	1.5	7.2	17.4
2001	1.6	7.4	18.0
2002	1.7	7.5	18.4
2003	1.9	7.6	19.0
2004	2.0	7.7	19.4
2005	2.1	7.8	19.8
2006	2.2	7.9	20.2

* Source: FAA Air Traffic Activity. DUATS began in 1990.

Notes: Total DUATS services are equal to the sum of flight plans originated and transactions, multiplied by two.

Appendix A

ACTIVE U.S. LARGE CERTIFICATED AIR CARRIERS FY 1994

Air Carrier	Code	REPORTING ENTITIES DOM	INT	ATL	LAM	PAC
Major Carriers						
America West		X	X		X	
American		X	X	X	X	X
Continental		X	X	X	X	
Delta		X	X	X	X	X
Federal Express	C	X	X	X	X	X
Northwest		X	X	X		X
Southwest		X				
Trans World		X	X	X		
United		X	X	X	X	X
United Parcel	C	X	X	X	X	X
USAir		X	X	X	X	
National Carriers						
Air Wisconsin Corp.		X				
Alaska		X	X		X	
Aloha		X				
American International	C	X	X			
American Trans Air		X	X	X		
Atlantic Southeast		X				
Business Express		X				
Carnival		X	X		X	
Continental Micronesia			X			X
DHL	C	X	X	X	X	
Emery	C	X	X			
Evergreen	C	X	X			X
Hawaiian		X	X			X
Horizon Air		X				
Markair		X				
Midwest Express		X				
Morris	NS	X	X			
Simmons		X				
Southern Air	C	X	X			X
Sun Country	NS	X	X			
Tower			X	X		
Trans States		X				
USAir Shuttle		X				
World	NS	X	X			
Large Regional Carriers						
Air Transport Intl.	C	X	X	X		
Amerijet	C	X	X			
Arrow	C	X	X			
Challenge Air Cargo	C		X		X	
Executive Airlines		X	X		X	

ACTIVE U.S. LARGE CERTIFICATED AIR CARRIERS
FY 1994 (cont.)

Air Carrier	Code	REPORTING ENTITIES DOM	INT	ATL	LAM	PAC
Large Regional Carriers (cont.)						
Express One	NS	X	X			
Florida West	C	X	X			
Kiwi		X				
MGM Grand		X				
Miami Air	NS	X	X			
Northern Air	C	X				
North American	NS	X				
Private Jet		X	X			
Reeve		X				
Reno		X				
Rich	NS	X	X			
UFS, Inc.		X				
USAfrica			X	X		
Worldwide		X	X		X	
Zantop	C	X				
Medium Regional Carriers						
Aerial	C		X		X	
Atlas Air	C		X			
AV Atlantic	NS	X				
Buffalo	C	X	X			
Capitol Air	NS	X	X			
Casino Express		X	X			
Eagle	NS	X	X			
Fine	C	X	X			
Intl. Cargo Express	NS		X			
Kitty Hawk	C	X	X			X
Midway		X				
Millon	C		X			
Patriot	C	X	X			
Ryan Intl.	NS	X	X			
Sierra Pacific	NS	X				
Spirit		X				
Trans Air Link	C	X	X			
Trans American Charter	NS	X				
Ultrair		X	X			
Valujet		X				

Codes: C=Cargo only, NS=Nonscheduled.
NOTE: Some carriers listed are included in the data base because they operated during the year, even though they were out of business by the end of the fiscal year. Carriers are classified by RSPA based on annual operating revenues as follows: Major=$1 billion +; Nationals=$100 million to $1 billion; Large Regionals= $20 million to $99.99 million; Medium Regionals=$0 to $19.99 million.

Appendix B

CARRIERS NO LONGER INCLUDED IN AIR CARRIER DATA BASE

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
1. Aeromech (KC)	S	MR	7-79		5-81**
2. Aeron	F	MR		4-83	5-89*
3. Air America	S	LR			12-89*
4. Air Atlanta (CC)	S	LR	2-84		7-86*
5. AirCal (OC)	S	N	1-79		3-87m
6. Air Florida (QH)	S	N	1-79	7-80	5-84*
7. Air Illinois (UX)	S	LR	1-83		2-84*
8. Airlift (RD)	C	MR	7-84	7-84	12-85*
9. Airmark	C	MR	8-84	9-84	7-93*
10. Air Midwest (ZV)	S	LR	X		12-84**
11. Air National (AH)	C	LR		4-84	6-84*
12. Air Nevada (LW)	S	MR	4-81		7-82**
13. Air New England (NE)	S	MR	X		10-81*
14. Air North (NO)	S	MR	6-80		8-82**
15. Air North/Nenana (XG)	S	MR	3-81		8-82**
16. Air One (CB)	S	LR	4-83		7-84*
17. AirPac (RI)	S	LR	4-84		12-85*
18. All Star (LS)	S	MR	4-83	4-83	10-85*
19. Altair (AK)	S	MR	1-79		9-82*
20. American Int'l. (AV)	S	LR	11-82		9-84*
21. Apollo (ID)	S	MR	5-79		7-81**
22. Arista (RI)	C	MR	12-82	8-82	3-84*
23. Aspen (AP)	S	LR	1-85		4-91m
24. Atlantic Gulf (ZY)	C	MR	9-85		7-86*
25. Best (IW)	S	MR	7-82		10-85**
26. Big Sky (GQ)	S	MR	6-79		9-82**
27. Blue Bell (BB)	C	MR	6-83		2-84*
28. Braniff (BN) (8)	S	N	3-84		6-89*
29. Braniff International	S	LR	7-91		5-92*
30. Britt (RU)	S	LR	10-84		6-87**
31. Cascade (CZ)	S	LR	1-85		11-85*
32. Capitol (CL)	S	N	7-80	7-81	9-84*
33. Challenge (CN)	F	MR		8-82	6-86*
34. Challenge Air Int'l.	S	MR		7-86	8-87*
35. Cochise (DP)	S	MR	1-79		12-81*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Date of First Reported Traffic (3) Int'l.	Date of Last Reported Traffic (4)
36. Coleman (CH)	S	MR	9-79		3-80*
37. Colgan (CJ)	S	MR	4-81		3-83**
38. Connor	F	MR		X	7-91*
39. Discovery	S	LR	3-90		7-90*
40. Eastern (EA)	S	M	X	X	1-91*
41. Emerald (OD)	S	LR	7-82		6-91*
42. Empire (UR)	S	LR	10-79		6-94m
43. Five Star (12)	C	LR	12-85		5-89*
44. Flagship Express	F	LR	X	X	12-91*
45. Flight International	C	MR	4-84	6-84	9-85*
46. Florida Express (ZO)	S	LR	1-84	1-87	2-89m
47. Flying Tiger (FT)	F	M	X	X	8-89m
48. Frontier (FL)	S	N	X	X	8-86m
49. Frontier Horizon (FH)	S	LR	1-84		1-85*
50. Galaxy (GY)	C	MR	10-83	12-83	5-87*
51. Global (GL)	C	LR	X	X	12-84*
52. Golden Gate (GG)	S	MR	5-80		7-81*
53. Golden West (GW)	S	MR	2-79		7-82**
54. Gulf Air Transport (GA)	C	MR		1-85	12-89*
55. Guy America (HX)	S	MR		8-81	2-83*
56. Hawaii Express (LP)	S	LR	10-82		10-83*
57. Imperial (II)	S	MR	1-80		6-82**
58. Independent Air	C	MR			7-90
59. International Air Service	C	LR	7-88		3-89*
60. Int'l. Air Service (IE)	C	LR	11-83		5-85*
61. Interstate	F	LR	5-85	5-85	10-87*
62. Jet America (SI)	S	N	1-82		8-87m
63. Jet Charter	C	MR	7-82	7-82	5-85*
64. Kodiak (KO)	S	MR	X		11-82**
65. L.A.B. (JF)	S	MR	1-82		8-82**
66. McClain (MU)	S	LR	11-86		2-87**
67. Mid-South (VL)	S	MR	6-80		2-84*
68. Midstate (IU)	S	MR	7-81		7-82**
69. Mid Pacific (HO)	S	LR	10-85		9-87*
70. Midway (ML)	S	N	11-79		11-91*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
71. Midway Express	S	LR	10-84		7-85*
72. Mississippi Valley (XV)	S	MR	4-79		8-82**
73. Munz (XY)	S	MR	X		8-83*
74. New Air (NC)	S	MR	5-79		9-82**
75. New York Air (NY)	S	N	12-80		12-86m
76. New Wien (WC)	S	MR	9-85		10-85*
77. Northeastern (QS)	S	LR	7-84		2-85*
78. Orion	F	MR	1-87	1-87	12-89
79. Overseas (OV)	C	LR	10-82		10-85*
80. Ozark (OZ)	S	N	X		9-86m
81. Pacific East (PR)	S	LR	9-82		3-84*
82. Pacific Express (VB)	S	LR	2-82		10-83*
83. Pacific Southwest (PS)	S	N	1-79		4-88m
84. Pan American (PA)	S	M	X	X	12-91*
85. Peninsula (KS)	S	MR	1-82		1-83**
86. People Express (PE)	S	N	5-81	5-83	12-86m
87. Piedmont (PI)	S	M	X	7-87	8-89m
88. Pilgrim (PM)	S	LR	9-85		12-86*
89. Ports of Call Travel Club	C	LR	9-85		1-86*
90. Presidential (XV)	S	LR	10-85	11-89*	
91. Pride Air (NI)	S	LR	10-85		11-85*
92. Republic (RC)	S	M	X		9-86m
93. Rocky Mountain (JC)	S	MR	7-81		9-82**
94. Royale (OQ)	S	LR	3-84		6-84**
95. Royal West	S	LR	7-86		
96. Ryan	C	LR	4-84	4-84	5-86*
97. Sea Airmotive (KJ)	S	MR	1-80		6-82**
98. Sky Bus (FW)	S	MR	7-85		11-86*
99. Skystar	C	MR	1-85	3-85	1-87*
100. Sky West (QG)	S	MR	7-79		12-84**
101. Sky World	C	LR	10-85	10-85	7-89*
102. Samoa (MB)	S	MR		2-85	6-85*
103. Southeast (NS)	S	MR	7-79		1-80*
104. South Pacific Island (HK)	S	LR		7-81	11-86*
105. Sun Coast (WS)	C	MR		5-87	9-87*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
106. Sunworld (JK)	S	LR	5-83		9-88
107. Swift Aire (WI)	S	MR	1-79		7-81*
108. T-Bird (DQ)	C	MR		4-82	8-84*
109. Total Air (TA)	C	MR	10-84	5-85	1-87*
110. TPI International	F	MR		3-90	8-90*
111. Transamerica (TV)	S	N		5-79	9-86*
112. Trans Continental	C	MR	1-89		1-92*
113. Trans International	F	MR	5-85	1-85	12-88*
114. Transtar (MA)	S	LR	8-81		8-87m
115. Universal	F	MR		X	3-90
116. Westair	S	N			
117. Western (WA)	S	M	X	X	3-87m
118. Western Yukon (WX)	S	MR	7-81		6-82*
119. Wien (WC)	S	N	X		11-84*
120. Wilbur's	F	MR	8-91		3-92
121. Worldwide	C	MR	10-84	10-84	3-94*
122. Wrangler					1-93
123. Wright (FW)	S	MR	X		11-82**

(1) S = Scheduled; C = Charter; F = All-Cargo.
(2) M = Majors; N = Nationals; LR = Large Regionals; MR = Medium Regionals.
(3) Date of first reported traffic is indicated for those carriers starting service since the passage of the Airline Deregulation Act of 1978. Traffic reported by those carriers certificated prior to deregulation is indicated by an X.
(4) Carriers that have discontinued scheduled passenger service indicated by an *. Carriers now filing RSPA Form 298-C in lieu of RSPA Form 41 indicated by **. Carriers that have merged operations indicated by an m.

Appendix C

U.S. AIR CARRIERS

NONSCHEDULED TRAFFIC AND CAPACITY

DOMESTIC

FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	8,142	6,078	74.6	3,840
1985	9,841	7,491	76.1	5,318
1986	8,404	6,345	75.5	4,856
1987	6,170	4,422	71.7	3,933
1988	6,651	4,954	74.5	4,490
1989	6,862	5,128	74.7	4,887
1990	7,393	5,551	75.1	5,208
1991	7,888	5,488	69.5	5,041
1992	8,473	6,374	75.2	5,645
1993	10,172	7,726	75.9	7,391
1994E	11,346	8,537	75.2	6,788

INTERNATIONAL

FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	8,513	7,385	86.8	2,824
1985	8,637	7,438	86.1	2,857
1986	7,517	6,327	84.2	2,662
1987	10,510	8,626	82.1	3,708
1988	11,118	9,148	82.3	3,932
1989	12,165	9,444	77.6	4,660
1990	11,220	8,152	72.7	3,906
1991	16,325	10,566	64.7	4,213
1992	10,804	8,152	75.5	3,619
1993	11,710	8,526	72.8	3,863
1994E	11,346	8,537	75.2	4,542

U.S. AIR CARRIERS

NONSCHEDULED TRAFFIC AND CAPACITY (Continued)

	TOTAL			
FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	16,655	13,463	80.8	6,664
1985	18,478	14,929	80.8	8,175
1986	15,921	12,672	79.6	7,518
1987	16,680	13,048	78.2	7,641
1988	17,769	14,102	79.4	8,422
1989	19,027	14,570	76.6	9,547
1990	18,613	13,703	73.6	9,114
1991	24,213	16,055	66.3	9,254
1992	19,277	14,526	75.4	9,264
1993	21,882	16,252	74.3	11,590
1994E	23,760	17,470	73.5	11,330

Source: RSPA Form 41

Appendix D

U.S. AIR CARRIERS

CARGO REVENUE TON MILES
(In Millions)

FREIGHT/EXPRESS RTMs

FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	4,391	3,328	7,719
1985	3,943	3,340	7,284
1986	4,869	3,988	8,857
1987	5,782	4,781	10,563
1988	6,699	5,702	12,401
1989	7,413	6,749	14,162
1990	7,542	6,771	14,313
1991	7,451	6,907	14,358
1992	7,859	6,819	14,678
1993	8,557	7,541	16,098
1994E	9,324	8,919	18,243

MAIL RTMs

FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	1,145	441	1,586
1985	1,203	450	1,653
1986	1,233	438	1,671
1987	1,314	435	1,749
1988	1,423	463	1,886
1989	1,463	488	1,951
1990	1,478	516	1,994
1991	1,463	507	1,970
1992	1,612	500	2,102
1993	1,817	505	2,322
1994E	1,999	509	2,508

U.S. AIR CARRIERS
CARGO REVENUE TON MILES (Continued)
(In Millions)

	TOTAL RTMs		
FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	5,536	3,769	9,305
1985	5,146	3,790	8,936
1986	6,102	4,426	10,528
1987	7,096	5,216	12,312
1988	8,122	6,165	14,287
1989	8,876	7,237	16,113
1990	9,020	7,287	16,307
1991	8,914	7,414	16,328
1992	9,471	7,319	16,790
1993	10,374	8,046	18,420
1994E	11,323	9,428	20,751

Source: RSPA Form 41

Appendix E

ACTIVE U.S. REGIONALS/COMMUTERS

1. Action Air
2. Air Alpha
3. Air LA
4. Air Midwest
5. Air Molokai
6. Air Nevada
7. Air St. Thomas
8. Air Sunshine
9. Air Vantage
10. Air Vegas
11. Airways International
12. Alaska Island Air *
13. Allegheny Commuter
14. Aloha IslandAir
15. Alpha Air
16. Alpine Air
17. Arctic Circle Airlines *
18. Arizona Airways
19. Arizona Pacific Airways
20. Astral Aviation
21. Atlantic Coast Airlines
22. Atlantic Southeast **
23. Baker Aviation *
24. Bellair *
25. Bemidji
26. Bering Air *
27. Big Sky
28. Business Express **
29. Cape Air
30. Cape Smythe *
31. Caribair
32. CCAir
33. Chalks International
34. Chautauqua Airlines
35. Chicago Express Airlines
36. Coastal Air Transport
37. Colgan Air
38. Comair
39. Commutair
40. Conquest Airlines
41. Continental Express
42. Crown Airways
43. Direct Air
44. Eclipse Airlines
45. Ellis Air Taxi *
46. Empire Airlines **
47. ERA Aviation *
48. Executive Airlines **
49. Express Airlines I
50. Express Airlines II
51. F. S. Air Service *
52. Flagship Airlines
53. Flamenco
54. Four Star Aviation
55. Freedom Aviation *
56. Frontier Flying Service *
57. GP Express
58. Grand Airways
59. Grand Canyon Helicopter
60. Grant Aviation *
61. Great Lakes Aviation
62. Greenbrier Airlines
63. Gulf Air Taxi *
64. Gulfstream International
65. Hageland Aviation Services *
66. Haines Airways *
67. Harbor Airlines
68. Horizon **
69. Iliamna Air Taxi *
70. Island Air

ACTIVE U.S. REGIONALS/COMMUTERS (Continued)

71. Island Express
72. Iliamna Air Taxi *
73. Island Express
74. Jet Express
75. Jetstream International
76. Katmailand *
77. Kenmore Air Harbor
78. Ketchikan Air Service *
79. LAB Flying Service *
80. Larry's Flying Service *
81. Las Vegas Airlines
82. Loken Aviation *
83. Lone Star Airlines
84. MarkAir Express *
85. Mesa Airlines
86. Mesaba Aviation
87. New England Airlines
88. New York Helicopters
89. Northeast Express Regional
90. Olson Air Service *
91. Pacific Island Aviation *
92. Paradise Island
93. Peninsula Airways *
94. Piedmont Airlines
95. Precision Airlines
96. Promech *
97. Redwing Airlines
98. Ross Aviation
99. Ryan Air Service *
100. Samoa Air *
101. Scenic Airlines
102. Simmons Airlines **
103. Skagway Air Service *
104. SkyWest Aviation
105. Southeast Airlines
106. Springdale Air
107. Sunaire
108. Tanana Air Service *
109. Taquan Air Service *
110. Tatonduk Flying Service *
111. Trans Air
112. Trans States Airlines **
113. Trans World Express
114. United Feeder Service **
115. Village Aviation *
116. Walker's International
117. Warblow's Air Venture *
118. Ward Air International *
119. West Isle Air
120. WestAir Airlines
121. Westates Airlines
122. Wings fo Alaska *
123. Wings West Airlines
124. WRA Inc.
125. Wright Air Venture *
126. Yutana Airlines *
127. Yute Air Alaska *
128. 40-Mile Air *

* Carriers, primarily in Alaska, whose traffic is not included in the regional/commuter data base and forecast.

** Carriers operate both large turbojet and turboprop aircraft and report traffic data on RSPA Form 41.

Appendix F

GENERAL AVIATION ACTIVITY SURVEY RESULTS 1989 - 1993

GENERAL AVIATION ACTIVE AIRCRAFT BY PRIMARY USE (In Thousands)

Use Category	1993	1992	1991	1990*	1989*
Corporate	9.9	9.4	10.0	10.1	11.5
Business	27.8	28.9	31.6	33.1	35.0
Personal	102.1	108.7	115.1	112.6	116.4
Instructional	15.6	16.0	17.9	18.6	16.6
Aerial Application	5.0	5.1	7.0	6.2	6.6
Aerial Observation	4.8	5.6	5.1	4.9	5.4
Sight Seeing	1.6	N/A	N/A	N/A	N/A
External Load	0.1	N/A	N/A	N/A	N/A
Other Work	1.0	1.7	1.7	1.4	2.0
Air Taxi	3.8	4.6	5.5	5.8	6.6
Other	4.2	3.5	3.9	4.1	3.6
Subtotal	175.9	183.6	197.8	196.8	203.7
Commuter Air Taxi	N/A	0.8	0.7	1.2	1.3
TOTAL	175.9	184.4	198.5	198.0	205.0

SOURCE: 1989-1993 General Aviation Activity Surveys.

* 1989 & 1990 Surveys adjusted to reflect effects of nonresponse.

N/A Sight Seeing and External Load added in 1993 as new use categories. Prior to 1993 these aircraft were included in one of the other nine use categories as appropriate.

Commuter aircraft were excluded from survey beginning in 1993.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION ACTIVITY SURVEY RESULTS (Continued)
1989 - 1993

GENERAL AVIATION AIRCRAFT
TOTAL HOURS FLOWN BY
PRIMARY USE
(In Thousands)

Use Category	1993	1992	1991	1990*	1989*
Corporate	2,659	2,262	2,617	2,913	3,453
Business	3,345	3,537	4,154	4,417	4,330
Personal	7,938	8,592	9,685	9,276	9,537
Instructional	4,680	5,340	6,141	7,244	5,993
Aerial Application	1,167	1,296	1,911	1,872	1,868
Aerial Observation	1,750	1,730	1,797	1,745	1,719
Sight Seeing	412	N/A	N/A	N/A	N/A
External Load	105	N/A	N/A	N/A	N/A
Other Work	175	343	471	572	517
Air Taxi	1452	2,009	2,241	2,249	3,020
Other	656	358	473	475	507
Subtotal	24,340	25,800	29,497	30,763	30,940
Commuter Air Taxi	N/A	693	570	1,333	1,392
TOTAL	24,340	26,493	30,067	32,096	32,332

SOURCE: 1989-1993 General Aviation Activity Surveys.

* 1988-1990 Surveys adjusted to reflect effects of nonresponse.

N/A Sight Seeing and External Load added in 1993 as new use categories. Prior to 1993 these aircraft were included in one of the other nine use categories as appropriate.

Commuter aircraft were excluded from survey beginning in 1993.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION ACTIVITY SURVEY RESULTS (Continued)
1989 - 1993

GENERAL AVIATION ACTIVE AIRCRAFT
BY AIRCRAFT TYPE
(In Thousands)

AIRCRAFT TYPE	1993	1992*	1991*	1990**	1989**
Fixed Wing--Total	155.3	170.8	184.6	184.5	190.8
Piston--Total	147.1	162.1	175.3	175.2	180.8
One Engine	130.7	143.6	154.1	154.0	158.9
Two Engine	16.4	18.5	21.1	21.1	21.8
Other Piston	0.0	O.1	0.1	0.1	0.1
Turboprop--Total	4.4	4.7	4.9	5.3	5.9
Single Engine	0.7	N/A	N/A	N/A	N/A
Two Engine	3.6	4.1	4.4	4.9	5.7
Other Turboprop	0.0	0.6	0.5	0.4	0.2
Turbojet--Total	3.9	4.0	4.4	4.1	4.1
Two Engine	3.7	3.8	4.1	3.7	3.7
Other Turbojet	0.2	0.2	0.3	0.4	0.4
Rotorcraft--Total	4.5	5.8	6.3	6.9	7.0
Piston	1.6	2.2	2.5	3.2	3.0
Turbine	2.8	3.5	3.8	3.7	4.0
Single Engine	2.1	N/A	N/A	N/A	N/A
Multi-engine	0.7	N/A	N/A	N/A	N/A
Other--Total	5.2	7.8	7.6	6.6	7.2
Experimental--Total	10.9	N/A	N/A	N/A	N/A
Subtotal	175.9	183.6	197.8	196.9	203.7
Commuter	N/A	0.8	0.7	1.1	1.3
Total All Aircraft	175.9	184.4	198.5	198.0	205.0

SOURCE: 1989-1993 General Aviation Activity Surveys.

* 1991-1992 Surveys adjusted to remove commuter aircraft.
** 1989-1990 Surveys adjusted to reflect effects of nonresponse and to remove commuter aircraft.

Commuter aircraft were excluded from survey beginning in 1993.

N/A Prior to 1993 Single Engine Turboprops were included in "Other" Turboprop. Experimental aircraft were included in one of the other aircraft types as appropriate.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION AIRCRAFT TOTAL HOURS FLOWN BY AIRCRAFT TYPE (In Thousands)

AIRCRAFT TYPE	1993	1992*	1991*	1990**	1989**
Fixed Wing--Total	21,421	23,801	26,851	29,546	29,327
Piston--Total	19,029	21,251	24,102	25,832	24,907
One Engine	16,514	18,074	20,540	21,883	20,600
Two Engine	2,514	3,172	3,555	3,897	4,292
Other Piston	1	4	7	53	16
Turboprop--Total	1,227	1,478	1,513	2,319	2,892
Single Engine	244	N/A	N/A	N/A	N/A
Two Engine	979	1,238	1,359	2,162	2,776
Other Turboprop	3	240	154	157	116
Turbojet--Total	1,165	1,072	1,236	1,396	1,527
Two Engine	1,126	1,030	1,183	1,279	1,424
Other Turbojet	39	42	54	117	103
Rotorcraft--Total	1,832	2,283	2,757	2,209	2,610
Piston	370	416	585	716	692
Turbine	1,462	1,866	2,172	1,493	1,918
Single Engine	1,073	N/A	N/A	N/A	N/A
Multi-engine	389	N/A	N/A	N/A	N/A
Other--Total	376	410	459	341	396
Experimental--Total	711	N/A	N/A	N/A	N/A
Subtotal	24,340	25,800	29,497	30,763	30,940
Commuter	N/A	693	570	1,333	1392
Total All Aircraft	24,340	26,493	30,067	32,096	32,332

SOURCE: 1989-1993 General Aviation Activity Surveys.

* 1991-1992 Surveys adjusted to remove commuter aircraft.
** 1989-1990 Surveys adjusted to reflect effects of nonresponse and to remove commuter aircraft.

N/A Prior to 1993 Single Engine Turboprops were included in "Other" Turboprop. Experimental aircraft were included in one of the other aircraft types as appropriate.

Commuter aircraft were excluded from survey beginning in 1993.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

Appendix G

GENERAL AVIATION AIRCRAFT COST INDICES

SINGLE ENGINE PISTON AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	83.9	82.4	56.8	60.7
1971	83.5	85.2	54.8	59.6
1972	85.0	88.5	53.7	59.3
1973	80.1	91.1	55.6	61.2
1974	72.1	97.3	67.7	72.2
1975	75.3	95.5	66.3	70.7
1976	82.6	110.0	68.3	74.9
1977	83.3	112.7	74.9	80.8
1978	81.6	109.0	79.5	83.8
1979	80.9	102.6	88.9	90.3
1980	74.8	96.5	99.3	97.6
1981	84.5	92.7	105.1	101.6
1982	90.2	98.2	103.2	101.0
1983	100.0	100.0	100.0	100.0
1984	103.9	99.6	97.3	95.7
1985	104.3	99.4	93.0	91.5
1986	109.6	99.6	84.4	86.1
1987	*	97.9	80.1	82.3
1988	*	96.7	76.9	79.5
1989	*	94.8	73.3	76.3
1990	*	93.0	73.9	76.4
1991	*	92.1	76.8	78.6
1992	*	91.5	73.5	75.8
1993	*	91.1	71.0	73.8
1994	*	92.1	70.4	73.5

* Not calculated because all models in index have stopped production.
Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

MULTI-ENGINE PISTON AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	85.6	99.2	56.0	69.1
1971	89.8	98.1	54.0	67.4
1972	96.1	95.2	52.9	65.7
1973	90.5	97.7	54.8	67.8
1974	83.8	104.9	66.7	78.3
1975	87.8	111.0	65.3	79.1
1976	90.8	120.9	67.3	83.5
1977	91.2	123.3	73.8	88.8
1978	93.5	119.9	78.3	90.9
1979	93.4	113.5	87.5	95.4
1980	90.3	104.6	97.8	99.8
1981	93.4	99.1	103.5	102.2
1982	96.9	99.2	101.7	102.3
1983	100.0	100.0	100.0	100.0
1984	111.9	99.6	94.9	96.3
1985	122.2	99.4	89.8	92.7
1986	125.8	99.5	83.1	88.1
1987	120.6	97.8	78.9	84.6
1988	124.8	96.6	75.7	82.0
1989	129.8	94.8	72.2	79.1
1990	135.2	92.9	72.8	78.9
1991	132.8	92.0	75.6	80.6
1992	136.0	91.4	72.4	78.1
1993	139.0	91.0	70.0	76.3
1994	142.3	92.0	69.4	76.3

Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

TURBOPROP AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	110.1	136.0	54.7	73.1
1971	113.0	135.3	55.4	73.5
1972	116.6	127.1	54.8	71.2
1973	109.8	130.4	61.3	77.0
1974	101.9	140.1	68.1	84.4
1975	103.1	142.6	66.8	84.0
1976	107.6	140.3	66.3	83.1
1977	101.0	126.3	68.8	81.4
1978	98.6	127.8	77.8	89.1
1979	97.4	117.7	93.7	99.1
1980	93.3	105.5	98.4	100.0
1981	98.0	99.1	101.8	101.2
1982	95.9	99.2	99.8	99.7
1983	100.0	100.0	100.0	100.0
1984	99.9	99.6	95.9	96.7
1985	107.0	99.4	91.6	93.3
1986	110.1	99.5	80.4	84.8
1987	108.1	97.8	77.6	82.2
1988	121.8	96.6	74.5	79.5
1989	125.2	94.8	71.1	76.5
1990	128.0	92.9	74.1	78.4
1991	127.9	92.0	78.3	81.4
1992	132.0	91.4	74.8	78.6
1993	136.6	91.0	72.7	76.9
1994	136.9	92.0	72.1	76.6

Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

TURBOJET AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	90.2	117.4	54.7	66.3
1971	86.3	114.4	55.4	66.3
1972	94.6	115.3	54.8	66.0
1973	89.4	118.3	61.3	71.8
1974	84.2	127.0	59.2	71.7
1975	85.0	125.5	66.8	77.6
1976	86.6	129.8	66.3	78.0
1977	88.7	133.3	68.8	80.7
1978	92.2	128.8	77.8	87.2
1979	91.7	119.1	93.7	98.4
1980	96.9	106.9	98.4	100.0
1981	92.7	99.1	101.8	101.3
1982	97.6	99.2	99.8	99.7
1983	100.0	100.0	100.0	100.0
1984	99.8	99.6	95.9	96.5
1985	100.7	99.4	91.6	93.0
1986	106.2	99.5	80.4	84.0
1987	106.0	97.8	77.6	81.3
1988	108.0	96.6	74.5	78.6
1989	102.7	94.8	71.1	75.5
1990	108.2	92.9	74.1	77.6
1991	105.7	92.0	78.3	80.8
1992	114.1	91.4	74.8	77.9
1993	116.5	91.0	72.7	76.1
1994	122.5	92.0	72.1	75.8

Source: FAA-APO Estimates

Appendix H

FAA TOWERED AIRPORTS

Birmingham, AL (BHM)
Dothan, AL (DHN)
Huntsville Madison County, AL (HSV)
Mobile Bates Field, AL (MOB)
Montgomery Dannelly Field, AL (MGM)

*Tuscaloosa Van De Graaf, AL (TCL)
Anchorage International, AK (ANC)
Anchorage Lake Hood SPB, AK (LHD)
Anchorage Merrill, AK (MRI)
Bethel, AK (BET)

Fairbanks International, AK (FAI)
Juneau, AK (JNU)
Kenai Municipal, AK (ENA)
*King Salmon, AK (AKN)
Kodiak, AK (ADQ)

Deer Valley, AZ (DVT)
Falcon/Mesa, AZ (FFZ)
Goodyear, AZ (GYR)
Grand Canyon Municipal, AZ (GCN)
Phoenix Sky Harbor Int'l., AZ (PHX)

Prescott, AZ (PRC)
Scottsdale, AZ (SDL)
Tucson, AZ (TUS)
Fayetteville Drake Field, AR (FYV)
Fort Smith Municipal, AR (FSM)

Little Rock Adams Field, AR (LIT)
*Texarkana, AR (TXK)
Bakersfield Meadows Field, CA (BFL)
Burbank, CA (BUR)
Camarillo, CA (CMA)

Carlsbad Palomar, CA (CRQ)
Chico, CA (CIC)
Chino, CA (CNO)
Concord, CA (CCR)
El Monte, CA (EMT)

Fresno Air Terminal, CA (FAT)
Fullerton Municipal, CA (FUL)
Hawthorne, CA (HHR)
Hayward, CA (HWD)
La Verne Brackett, CA (POC)

*Lancaster Fox Airport, CA (WJF)
Livermore Municipal, CA (LVK)
Long Beach, CA (LGB)
Los Angeles International, CA (LAX)
*Modesto City County, CA (MOD)

Monterey, CA (MRY)
Napa County, CA (APC)
Oakland International, CA (OAK)
Ontario, CA (ONT)
*Oxnard Ventura County, CA (OXR)

Palm Springs Municipal, CA (PSP)
*Palmdale, CA (PMD)
Palo Alto, CA (PAO)
Redding, CA (RDD)
Riverside Municipal, CA (RAL)

Sacramento Executive, CA (SAC)
Sacramento Metro, CA (SMF)
*Salinas Municipal, CA (SNS)
San Carlos, CA (SQL)
San Diego Brown Field, CA (SDM)

San Diego Gillespi, CA (SEE)
San Diego Lindberg, CA (SAN)
San Diego Montgomery, CA (MYF)
San Francisco, CA (SFO)
San Jose International, CA (SJC)

San Jose Reid Hillview, CA (RHV)
*San Luis Obispo, CA (SBP)
Santa Ana/Orange County, CA (SNA)
Santa Barbara, CA (SBA)
*Santa Maria Public, CA (SMX)

FAA TOWERED AIRPORTS

Santa Monica, CA (SMO)
Santa Rosa Sonoma County, CA (STS)
South Lake Tahoe, CA (TVL)
Stockton, CA (SCK)
Torrance Municipal, CA (TOA)

Van Nuys, CA (VNY)
Aspen Pitkin County, CO (ASE)
Broomfield Jefferson County, CO (BJC)
Colorado Springs, CO (COS)
Denver Stapleton Int'l., CO (DEN)

Denver/Centennial, CO (APA)
Grand Junction, CO (GJT)
Pueblo, CO (PUB)
Bridgeport, CT (BDR)
Danbury Municipal, CT (DXR)

*Groton/New London, CT (GON)
*Hartford Brainard, CT (HFD)
*New Haven, CT (HVN)
Windsor Locks, CT (BDL)
Wilmington Greater Wilmington, DE (ILG)

Washington National, DC (DCA)
Craig Field Jacksonville, FL (CRG)
Daytona Beach, FL (DAB)
Fort Lauderdale, FL (FLL)
Fort Lauderdale Executive, FL (FXE)

Fort Myers Page Field, FL (FMY)
Fort Myers Regional, FL (RSW)
Fort Pierce, FL (FPR)
*Gainesville, FL (GNV)
Hollywood, FL (HWO)

Jacksonville International, FL (JAX)
*Key West, FL (EYW)
Melbourne, FL (MLB)
Miami International, FL (MIA)
Opa Locka, FL (OPF)

Orlando Executive, FL (ORL)
Orlando International Airport, FL (MCO)
*Panama City Bay County, FL (PFN)
Pensacola, FL (PNS)
Pompano Beach Airpak, FL (PMP)

Sanford, FL (SFB)
Sarasota Bradenton, FL (SRQ)
St. Petersburg Clearwater, FL (PIE)
St. Petersburg Whitt, FL (SPG)
Tallahassee, FL (TLH)

Tamiami, FL (TMB)
Tampa International, FL (TPA)
Vero Beach, FL (VRB)
West Palm Beach, FL (PBI)
Albany, GA (ABY)

Atlanta DeKalb Peachtree, GA (PDK)
Atlanta Fulton County, GA (FTY)
Atlanta International, GA (ATL)
Augusta, GA (AGS)
Columbus, GA (CSG)

Macon Lewis B. Wilson, GA (MCN)
Savannah Municipal, GA (SAV)
Hilo General Lyman Field, HI (ITO)
Honolulu, HI (HNL)
Kahului, HI (OGG)

Kailua-Kona/Keahole-Kona, HI (KOA)
*Lihue, HI (LIH)
*Molokai, HI (MKK)
Boise, ID (BOI)
Idaho Falls Fanning Field, ID (IDA)

*Lewiston, ID (LWS)
*Pocatello, ID (PIH)
Twin Falls, ID (TWF)
*Alton St. Louis Regional, IL (ALN)
Aurora Municipal, IL (ARR)

Bloomington/Normal, IL (BMI)
Carbondale, IL (MDH)
Champaign Univeristy of Illinois, IL (CMI)
Chicago Du Page, IL (DPA)
Chicago Meigs, IL (CGX)

Chicago Midway, IL (MDW)
Chicago O'Hare International, IL (ORD)
Chicago Palwaukee, IL (PWK)
Decatur, IL (DEC)
East St. Louis State Park, IL (CPS)
Moline, IL (MLI)

FAA TOWERED AIRPORTS

Peoria, IL (PIA)
Rockford, IL (RFD)
Springfield Capital, IL (SPI)
Bloomington Monroe County, IN (BMG)
Evansville, IN (EVV)

Fort Wayne, IN (FWA)
Indianapolis International, IN (IND)
Lafayette Purdue University, IN (LAF)
Muncie Delaware County, IN (MIE)
South Bend, IN (SBN)

Terre Haute, IN (HUF)
Cedar Rapids, IA (CID)
Des Moines Municipal, IA (DSM)
Dubuque, IA (DBQ)
Sioux City Municipal, IA (SUX)

Waterloo, IA (ALO)
Hutchinson, KS (HUT)
*Olathe, KS (OJC)
*Salina, KS (SLN)
Topeka Forbes Field, KS (FOE)

Wichita Mid Continent, KS (ICT)
Cincinnati Greater, KY (CVG)
Lexington, KY (LEX)
Louisville Bowman, KY (LOU)
Louisville Standiford, KY (SDF)

*Alexandria, LA (ESF)
Baton Rouge Ryan Field, LA (BTR)
Houma, LA (HUM)
Lafayette, LA (LFT)
Lake Charles, LA (LCH)

Monroe, LA (MLU)
New Orleans Lakefront, LA (NEW)
New Orleans Moisant, LA (MSY)
Shreveport Regional, LA (SHV)
Shreveport Downtown, LA (DTN)

Bangor International, ME (BGR)
Portland, ME (PWM)
Baltimore Washington Int'l, MD (BWI)
Camp Springs Andrews AFB, MD (ADW)
*Hagerstown, MD (HGR)

Bedford, MA (BED)
Beverly Muncipal, MA (BVY)
Boston Logan, MA (BOS)
*Hyannis, MA (HYA)
Lawrence, MA (LWM)

Natucket Memorial, MA (ACK)
New Bedford, MA (EWB)
Norwood, MA (OWD)
*Westfield, MA (BAF)
*Worcester, MA (ORH)

Ann Arbor Municipal, MI (ARB)
Battle Creek, MI (BTL)
*Detroit City, MI (DET)
Detroit Metro Wayne County, MI (DTW)
Detroit Willow Run, MI (YIP)

Flint Bishop, MI (FNT)
Grand Rapids, MI (GRR)
Jackson Reynolds Municipal, MI (JXN)
Kalamazoo, MI (AZO)
Lansing, MI (LAN)

Muskegon, MI (MKG)
Pontiac, MI (PTK)
Saginaw Tri City, MI (MBS)
Traverse City, MI (TVC)
Duluth, MN (DLH)

Minneapolis Crystal, MN (MIC)
Minneapolis Flying Cloud, MN (FCM)
Minneapolis St. Paul Int'l., MN (MSP)
Rochester, MN (RST)
St. Paul, MN (STP)

Greenville Municipal, MS (GLH)
Gulfport, MS (GPT)
*Jackson Hawkins, MS (HKS)
Jackson Municipal Airport, MS (JAN)
*Meridian Key, MS (MEI)

Columbia Regional, MO (COU)
Joplin, MO (JLN)
Kansas City International, MO (MCI)
Kansas City Municipal, MO (MKC)
*Springfield, MO (SGF)

FAA TOWERED AIRPORTS

St. Joseph, MO (STJ)
St. Louis International, MO (STL)
St. Louis Spirit of St. Louis, MO (SUS)
Billings, MT (BIL)
Great Falls, MT (GTF)

Helena, MT (HLN)
Missoula, MT (MSO)
Grand Island, NE (GRI)
Lincoln Municipal, NE (LNK)
Omaha, NE (OMA)

Las Vegas McCarran Int'l, NV (LAS)
North Las Vegas, NV (VGT)
Reno International, NV (RNO)
Lebanon, NH (LEB)
Manchester, NH (MHT)

Atlantic City, NJ (ACY)
Caldwell, NJ (CDW)
Morristown, NJ (MMU)
Newark, NJ (EWR)
Teterboro, NJ (TEB)

Trenton, NJ (TTN)
Albuquerque Int'l, NM (ABQ)
Roswell, NM (ROW)
Santa Fe, NM (SAF)
Albany County, NY (ALB)

Binghamton Broome County, NY (BGM)
Buffalo International, NY (BUF)
Elmira, NY (ELM)
Farmingdale, NY (FRG)
Islip MacArthur, NY (ISP)

Ithaca Tompkins County, NY (ITH)
John F. Kennedy International, NY (JFK)
La Guardia, NY (LGA)
*Niagara Falls, NY (IAG)
Poughkeepsie Dutchess County, NY (POU)

Rochester Monroe County, NY (ROC)
Syracuse Hancock International, NY (SYR)
Utica, NY (UCA)
White Plains Westchester, NY (HPN)
Asheville, NC (AVL)

Charlotte Douglas, NC (CLT)
Fayetteville Grannis, NC (FAY)
Greensboro Regional, (GSO)
*Kinston, NC (ISO)
Raleigh Durham, NC (RDU)

Wilmington New Hanover County, NC (ILM)
Winston Salem, NC (INT)
Bismark, ND (BIS)
Fargo Hector Field, ND (FAR)
Grand Forks International, ND (GFK)

Minot International, ND (MOT)
Akron Canton Regional, OH (CAK)
*Cincinnati Lunken, OH (LUK)
Cleveland Burke Lakefront, OH (BKL)
Cleveland Hopkins Int'l, OH (CLE)

Columbus Ohio State, OH (OSU)
Dayton, OH (DAY)
Mansfield Lahm Municipal, OH (MFD)
Port Columbus International, OH (CMH)
Toledo Express, OH (TOL)

Youngstown, OH (YNG)
Lawton Municipal, OK (LAW)
*Oklahoma City Wiley Post, OK (PWA)
Oklahoma City Will Rogers, OK (OKC)
Tulsa International, OK (TUL)

Tulsa Riverside, OK (RVS)
Eugene, OR (EUG)
Hillsboro, OR (HIO)
*Klamath Falls, OR (LMT)

Medford Jackson County, OR (MFR)
Portland International, OR (PDX)
*Salem McNary Field, OR (SLE)
*Troutdale, OR (TTD)
Allentown, PA (ABE)

Capital, City/Harrisburg, PA (CXY)
Erie, PA (ERI)
Harrisburg International, PA (MDT)
Lancaster, PA (LNS)
North Philadelphia, PA (PNE)

FAA TOWERED AIRPORTS

Philadelphia International, PA (PHL)
Pittsburgh Allegheny, PA (AGC)
Pittsburgh Greater International, PA (PIT)
Reading, PA (RDG)
Wilkes Barre, PA (AVP)

Williamsport, PA (IPT)
Providence, RI (PVD)
Charleston AFB Municipal, SC (CHS)
Columbia Metropolitan, SC (CAE)
Florence City, SC (FLO)

*Greenville Municipal, SC (GMU)
Greer, SC (GSP)
Myrtle Beach, SC (MYR)
Rapid City, SD (RAP)
Sioux Falls Foss Field, SD (FSD)

Bristol Tri City, TN (TRI)
Chattanooga, TN (CHA)
Knoxville McGhee Tyson, TN (TYS)
Memphis International, TN (MEM)
Nashville Metropolitan, TN (BNA)

Abilene, TX (ABI)
Amarillo, TX (AMA)
Austin, TX (AUS)
Beaumont Port Arthur, TX (BPT)
*Brownsville International, TX (BRO)

*College Station, TX (CLL)
Corpus Christi, TX (CRP)
Dallas Addison, TX (ADS)
Dallas Love Field, TX (DAL)
*Dallas Redbird, TX (RBD)

Dallas/Ft. Worth Int'l, TX (DFW)
El Paso International, TX (ELP)
Fort Worth Meacham, TX (FTW)
Fort Worth/Alliance, TX (AFW)
Harlingen Industrial AP, TX (HRL)

Houston Hobby, TX (HOU)
Houston Intercontinental, TX (IAH)
Longview, TX (GGG)
Lubbock, TX (LBB)
*McAllen, TX (MFE)

Midland, TX (MAF)
San Angelo, TX (SJT)
San Antonio International, TX (SAT)
*San Antonio Stinson, TX (SSF)
Tomball D. W. Hooks, TX (DWH)

Tyler, TX (TYR)
Waco Municipal, TX (ACT)
Ogden Municipal, UT (OGD)
Salt Lake City Int'l, UT (SLC)
Burlington International, VT (BTV)

*Charlottesville Albemarle, VA (CHO)
*Lynchburg, VA (LYH)
Manassas Municipal, VA (HEF)
Newport News, VA (PHF)
Norfolk International, VA (ORF)

Richmond Byrd Int'l, VA (RIC)
Roanoke, VA (ROA)
Washington Dulles Int'l, VA (IAD)

Everett Paine Field, WA (PAE)
Moses Lake Grant, WA (MWH)
Olympia, WA (OLM)
Pasco Tri Cities, WA (PSC)
Renton, WA (RNT)

Seattle Boeing, WA (BFI)
Seattle Tacoma Int'l, WA (SEA)
Spokane Felts Field, WA (SFF)
Spokane International, WA (GEG)
Tacoma Narrows, WA (TIW)

Walla Walla, WA (ALW)
Yakima Air Terminal, WA (YKM)
Charleston, WV (CRW)
Clarksburg Benedum, WV (CKB)
Huntington, WV (HTS)

*Morgantown, WV (MGW)
Parkersburg Wood County, WV (PKB)
Wheeling, WV (HLG)
*Appleton, WI (ATW)
Green Bay Austin Straubel, WI (GRB)

FAA TOWERED AIRPORTS

Janesville, WI (JVL)
Lacrosse, WI (LSE)
Madison, WI (MSN)
Milwaukee Mitchell, WI (MKE)
Milwaukee Timmerman, WI (MWC)
Oshkosh Wittman Field, WI (OSH)
Casper, WY (CPR)
Cheyene, WY (CYS)
San Juan International, PR (SJU)
*San Juan Isla Grande, PR (SIG)

St. Croix Alex Hamilton, VI (STX)
St. Thomas H.S. Truman, VI (STT)

Kwajalein AAF, WK (KWA)
Pago Pago International, AS (TUT)

* Scheduled to be converted to FAA contracted towers during FY 1995.

Appendix I

CONTRACT TOWERS

1. Brookley/Mobile Downtown, Alabama (BFM)
2. Flagstaff, Arizona (FLG)
3. Pacoima/Whitman, California (EGE)
4. Eagle County Regional, Colorado (EGE)
5. Lakeland, Florida (LAL)
6. Athens/Ben Epps, Georgia (AHN)
7. Valdosta Municipal, Georgia (VLD)
8. Hailey, Idaho (SUN)
9. Marion Williamson County, Illinois (MWA)
10. Waukegan, Illinois (UGN)
11. Gary Regional, Indiana (GYY)
12. Topeka-Phillip Ballard, Kansas (TOP)
13. Owensboro-Daviees County, Kentucky (OWB)
14. Paducah Barkley Field, Kentucky (PAH)
15. New Iberia, Louisiana (ARA)
16. Martha's Vineyard, Massachusetts (MVY)
17. Cape Girardeau, Missouri (CGI)
18. Nashua, New Hampshire (ASH)

CONTRACT TOWERS (Continued)

19. Farmington Municipal, New Mexico (FMN)
20. Hobbs Lea, New Mexico (HOB)
21. Cleveland-Cuyahoga County, Ohio (CGF)
22. Ardmore Municipal, Oklahoma (ADM)
23. Clinton Sherman, Oklahoma (CSM)
24. Enid Woodring Memorial, Oklahoma (WDG)
25. Norman/University of Oklahoma, Oklahoma (OUN)
26. Pendleton, Oregon (PDT)
27. North Myrtle Beach, South Carolina (CRE)
23. Laredo, Texas (LRD)
24. Bellingham, Washington (BLI)
25. Lewisburg-Greenbrier, West Virginia (LWB)

Appendix J

TERMINAL RADAR SERVICE AREAS

Birmingham, AL (BHM)
Huntsville Madison County, AL (HSV)
Mobile Bates Field, AL (MOB)
Montgomery Dannelly Field, AL (MGM)
Anchorage TRACON, AK (A11*)

Phoenix TRACON, AZ (P50*)
Tucson TRACON, AZ (U90*)
Fort Smith Municipal, AR (FSM)
Little Rock Adams Field, AR (LIT)
Bay TRACON (Oakland), CA (O90*)
Burbank TRACON, CA (B90)
Fresno Air Terminal, CA (FAT)
Monterey, CA (MRY)
Oakland International, CA (OAK/O90*)

Ontario TRACON, CA (O40*)
Palm Springs Municipal, CA (PSP)
Sacramento TRACON, CA (MCC*)
San Diego TRACON, CA (SAN/NKX*)

Santa Barbara, CA (SBA)
Southern CA TRACON, CA (SCT)
Colorado Springs, CO (COS)
Denver TRACON, CO (D84*)

Yankee TRACON (Bradley), CT (Y90*)
Washington National, DC (DCA)
Daytona Beach, FL (DAB)
Fort Myers Regional, FL (RSW)

Jacksonville International, FL (JAX)
Miami International, FL (MIA)
Orlando Int'l Airport, FL (MCO)
Pensacola TRACON, FL (P31*)
Sarasota Bradenton, FL (SRQ)

Tallahassee, FL (TLH)
Tampa International, FL (TPA)
West Palm Beach, FL (PBI)
Atlanta International, GA (ATL)
Augusta, GA (AGS)

Columbus, GA (CSG)
Macon/Middle GA Regional, GA (MCN)
Savannah Municipal, GA (SAV)

Boise, ID (BOI)
Champaign Univ. of Illinois, IL (CMI)
Chicago TRACON, IL (C90*)

Moline, IL (MLI)
Peoria, IL (PIA)
Rockford, IL (RFD)
Springfield Capital, IL (SPI)
Evansville, IN (EVV)

Fort Wayne, IN (FWA)
Indianapolis International, IN (IND)
South Bend, IN (SBN)
Cedar Rapids, IA (CID)
Des Moines Municipal, IA (DSM)

Wichita Mid Continent, KS (ICT)
Cincinnati Greater, KY (CVG)
Lexington, KY (LEX)
Louisville Standiford, KY (SDF)
Baton Rouge Ryan Field, LA (BTR)

Lafayette, LA (LFT)
Lake Charles, LA (LCH)
Monroe, LA (MLU)
New Orleans Moisant, LA (MSY)
Shreveport Regional, LA (SHV)

TERMINAL RADAR SERVICE AREAS

Bangor International, ME (BGR)
Portland, ME (PWM)
Baltimore TRACON, MD (B95*)
Camp Springs Andrews AFB, MD (ADW)
Boston TRACON, MA (A90*)

Detroit TRACON, MI (D21*)
Flint Bishop, MI (FNT)
Grand Rapids, MI (GRR)
Kalamazoo, MI (AZO)
Lansing, MI (LAN)

Muskegon, MI (MKG)
Saginaw Tri City, MI (MBS)
Minneapolis TRACON, MN (M98*)
Gulfport, MS (GPT)
Jackson Municipal, MS (JAN)

Kansas City International, MO (MCI)
St. Louis TRACON, MO (T75*)
Billings, MT (BIL)
Great Falls, MT (GTF)
Lincoln Municipal, NE (LNK)

Omaha TRACON, NE (R90*)
Las Vegas TRACON, NV (L30*)
Reno International, NV (RNO)
Atlantic City, NJ (ACY)

Albuquerque International, NM (ABQ)
Albany County, NY (ALB)
Binghamton Broome County, NY (BGM)
Buffalo International, NY (BUF)
Elmira, NY (ELM)

Griffiss AFB, NY (RME)
New York TRACON, NY (N90)
Rochester Monroe County, NY (ROC)
Syracuse Hancock Int'l, NY (SYR)

Asheville, NC (AVL)
Charlotte Douglas, NC (CLT)
Fayetteville Grannis, NC (FAY)
Greensboro Regional, NC (GSO)
Raliegh Durham, NC (RDU)

Wilmington New Hanover County, NC (ILM)
Fargo Hector Field, ND (FAR)
Akron Canton Regional, OH (CAK)
Cleveland Hopkins Int'l., OH (CLE)
Columbus International, OH (CMH)

Dayton, OH (DAY)
Toledo Express, OH (TOL)
Youngstown, OH (YNG)
Oklahoma City Will Rogers, OK (OKC)
Tulsa International, OK (TUL)

Portland TRACON, OR (P80*)
Allentown, PA (ABE)
Erie, PA (ERI)
Philadelphia International, PA (PHL)

Pittsburgh Greater Int'l, PA (PIT)
Wilkes Barre, PA (AVP)
Providence, RI (PVD)
Charleston AFB Municipal, SC (CHS)
Columbia Metropolitan, SC (CAE)

Greer, SC (GSP)
Bristol Tri City, TN (TRI)
Chattanooga, TN (CHA)
Knoxville McGhee Tyson, TN (TYS)
Memphis International, TN (MEM)

Nashville Metropolitan, TN (BNA)
Abilene, TX (ABI)
Amarillo, TX (AMA)
Austin, TX (AUS)
Beaumont Port Arthur, TX (BPT)

Corpus Christi, TX (CRP)
Dallas/Ft. Worth TRACON, TX (DFW/D10*)
El Paso International, TX (ELP)

Houston TRACON, TX (I90*)
Longview, TX (GCG)
Lubbock, TX (LBB)
Midland, TX (MAF)
San Antonio International, TX (SAT)

TERMINAL RADAR SERVICE AREAS

Salt Lake City TRACON, UT (S56*)
Burlington International, VT (BTV)
Norfolk Regional, VA (ORF)
Richmond Byrd International, VA (RIC)
Roanoke, VA (ROA)

Washington Dulles Int'l, VA (IAD)
Seattle/Tacoma TRACON, WA (S46*)
Spokane International, WA (GEG)
Charleston, WV (CRW)
Huntington, WV (HTS)

Green Bay Austin Straubel, WI (GRB)
Madison, WI (MSN)
Milwaukee Mitchell, WI (MKE)

* Indicates terminal radar approach control (TRACON)

Appendix K

GLOSSARY OF TERMS

Air Carrier Operations -- Arrivals and departures of air carriers certificated in accordance with FAR Parts 121 and 127.

Air Route Traffic Control Center (ARTCC) -- A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

Air Taxi -- An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

Air Traffic -- Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

Air Traffic Hub -- Cities and Metropolitan Statistical Areas requiring aviation services. May include more than one airport. Communities fall into four classes as determined by the community's percentage of the total enplaned passengers by scheduled air carriers in the 50 United States, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration:

1. Large: 1.00 percent (4,683,130 passengers and over in CY 1993).
2. Medium: 0.25 percent to 0.999 percent (between 1,170,783 and 4,863,130 passengers in CY 1993).
3. Small: 0.05 percent to 0.249 percent (between 234,157 and 1,170,783 passengers in CY 1993).
4. Nonhub: Less than 0.05 percent (fewer than 34,157 passengers in CY 1993).

Air Travel Club -- An operator certificated in accordance with FAR Part 123 to engage in the carriage of members who qualify for that carriage by payment of an assessment, dues, membership fees, or other similar remittance.

Aircraft Contacted -- Aircraft with which the flight service stations have established radio communications contact. One count is made for each en route landing or departing aircraft contacted by a flight service station, regardless of the number of contacts made with an individual aircraft during the same flight. A flight contacting five FSS's would be counted as five aircraft contacted.

Aircraft Handled -- See IFR AIRCRAFT HANDLED.

Aircraft Operations -- The airborne movement of aircraft in controlled or noncontrolled airport terminal areas, and counts at en route fixes or other points where counts can be made. There are two types of operations: local and itinerant.

1. LOCAL OPERATIONS are performed by aircraft that:

   (a) operate in the local traffic pattern or within sight of the airport;

   (b) are known to be departing for or arriving from flights in local practice areas located within a 20-mile radius of the airport;

   (c) execute simulated instrument approaches or low passes at the airport.

2. ITINERANT OPERATIONS are all aircraft operations other than local operations.

Airport Advisory Service -- A service provided by flight service stations at airports not served by a control tower. This service provides information to arriving and departing aircraft concerning wind direction/speed, favored runway, altimeter setting, pertinent-known traffic/field conditions, airport taxi routes/traffic patterns, and authorized instrument approach procedures. This information is advisory and does not constitute an ATC clearance.

Airport Traffic Control Tower -- A terminal facility that through the use of air/ground communications, visual signaling, and other devices, provides ATC services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the movement area.

All-Cargo Carrier -- An air carrier certificated in accordance with FAR Part 121 to provide scheduled air freight, express, and mail transportation over specified routes, as well as to conduct nonscheduled operations that may include passengers.

Approach Control Facility -- A terminal air traffic control facility providing approach control service.

Approach Control Service -- Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, for enroute aircraft. At some airports not served by an approach control facility, the ARTCC provides limited approach control service.

ARTCC -- See AIR ROUTE TRAFFIC CONTROL CENTER.

ASM's -- See AVAILABLE SEAT MILES.

Available Seat Miles (ASM's) -- The aircraft miles flown in a flight stage, multiplied by the number of seats available on that stage for revenue passenger use.

Business Transportation -- Any use of an aircraft, not for compensation or hire, by an individual for transportation required by the business in which the individual is engaged.

Center -- See AIR ROUTE TRAFFIC CONTROL CENTER.

Center Area -- The specified airspace within which an Air Route Traffic Control Center (ARTCC) provides air traffic control and advisory service.

Center Radar Approach Control (CERAP)

-- A combined Air Route Traffic Control Center (ARTCC) and a Terminal Radar Approach Control facility (TRACON).

CERAP -- See CENTER RADAR APPROACH CONTROL.

Commercial Air Carriers -- An air carrier certificated in accordance with FAR Part 121 or 127 to conduct scheduled services on specified routes. These air carriers may also provide nonscheduled or charter services as a secondary operation. Four carrier groupings have been designated for statistical and financial data aggregation and analysis.

1. MAJORS: Air carriers with annual operating revenues greater than $1 billion.

2. NATIONALS: Air carriers with annual operating revenues between $100 million and $1 billion.

3. LARGE REGIONALS: Air carriers with annual operating revenues between $10 million and $99,999,999.

4. MEDIUM REGIONALS: Air carriers with annual operating revenues less than $10 million.

Common IFR Room -- A highly automated terminal radar control facility. It provides terminal radar service in an area encompassing more than one major airport that accommodates instrument flight operations.

Commuter Air Carrier -- An air carrier certificated in accordance with FAR Part 135 or 121 that operates aircraft with a maximum of 60 seats, and that provides at least five scheduled round trips per week between two or more points, or that carries mail.

Commuter/Air Taxi Operations -- Arrivals and departures of air carriers certificated in accordance with FAR Part 135.

Direct User Access Terminal System -- An automated pilot self-friefing and flight plan filing system. For pilots with access to a computer, modem, and touch telephone, the system provides direct access to a national weather data base and the ability to file flight plans without contact with a flight service station.

Domestic Operations -- All air carrier operations having destinations within the 50 United States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

DUATS -- See DIRECT USER ACCESS TERMINAL SYSTEM

Executive Transportation -- Any use of an aircraft, not for compensation or hire, by a corporation, company or other organization for the purpose of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft.

FAA -- Federal Aviation Administration.

Facility -- See AIR TRAFFIC CONTROL TOWER.

Flight Plan -- Prescribed information relating to the intended flight of an aircraft that is filed orally or in writing with a flight service station or an air traffic control facility.

Flight Service Station (FSS) -- Air Traffic Service facilities within the National Airspace System that provide preflight pilot briefings and en route communications with IFR flights; assist lost IFR/VFR aircraft; assist aircraft

having emergencies; relay ATC clearances, originate, classify, and disseminate Notices to Airmen (NOTAM's); broadcast aviation weather and NAS information; receive and close flight plans; monitor radio NAVAIDS; notify search and rescue units of missing VFR aircraft; and operate the national weather teletypewriter systems. In addition, at selected locations, FSS's take weather observations, issue airport advisories, administer airmen written examinations, and advise Customs and Immigration of transborder flights.

Flight Services -- See TOTAL FLIGHT SERVICES.

Foreign Flag Air Carrier -- An air carrier other than a U.S. flag air carrier in international air transportation. "Foreign air carrier" is a more inclusive term than "foreign flag air carrier," including those non-U.S. air carriers operating solely within their own domestic boundaries. In practice, the two terms are used interchangeably.

FSS -- See FLIGHT SERVICE STATION.

General Aviation -- All civil aviation activity except that of air carriers certificated in accordance with FAR Parts 121, 123, 127, and 135. The types of aircraft used in general aviation (GA) activities cover a wide spectrum from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single engine piston acrobatic planes, balloons, and dirigibles.

General Aviation Operations -- Arrivals and departures of all civil aircraft, except those classified as air carrier and commuter/air taxi.

Hub -- See AIR TRAFFIC HUB.

IFR -- See INSTRUMENT FLIGHT RULES.

IFR Aircraft Handled -- The number of IFR departures multiplied by two, plus the number of IFR overs. This definition assumes that the number of departures (acceptances, extensions, and originations of IFR flight plans) is equal to the number of landings (IFR flight plans closed).

IFR Departures -- An IFR departure includes IFR flights that:

1. originate in a Center's area;
2. are extended by the Center; or
3. are accepted by the Center under sole enroute clearance procedures.

IFR Overs -- An IFR flight that originates outside the ARTCC area and passes through the area without landing.

IFSS -- See INTERNATIONAL FLIGHT SERVICE STATION.

International and Territorial Operations -- The operation of aircraft flying between the 50 United States and foreign points, between the 50 United States and U.S. possessions and territories, and between two foreign points. Includes both the combination passenger/cargo and the all-cargo carriers engaged in international and territorial operations.

Instructional Flying -- Any use of aircraft for the purpose of formal instruction with the flight instructor aboard, or with the maneuvers on the particular flight(s) specified by the flight instructor.

Instrument Approach -- A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. An instrument approach is prescribed and approved for a specific airport by competent authority (FAR Part 91).

Instrument Flight Rules (IFR) -- Rules governing the procedures for conducting instrument flight.

Instrument Operation -- An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility or air route traffic control center.

International Flight Service Station (IFSS) -- A central operations facility in the flight advisory system, manned and equipped to control aeronautical point-to-point telecommunications and air/ground telecommunications with pilots operating over international territory or waters, providing flight plan filing, weather information, search and rescue action, and other flight assistance operations.

Itinerant Operations -- See AIRCRAFT OPERATIONS.

Large Regionals -- See COMMERCIAL AIR CARRIERS.

Local Operations -- See AIRCRAFT OPERATIONS.

Majors -- See COMMERCIAL AIR CARRIERS.

Medium Regionals -- See COMMERCIAL AIR CARRIERS.

Military Operations -- Arrivals and departures of aircraft not classified as civil.

Nationals -- See COMMERCIAL AIR CARRIERS.

Personal/Pleasure Flying -- Any use of an aircraft for personal purposes not associated with a business or profession, and not for hire. This includes maintenance of pilot proficiency.

Pilot Briefing -- A service provided by the flight service station to assist pilots in flight planning. Briefing items may include weather information, NOTAM's, military activities, flow control information, and other items as requested.

Radar Air Traffic Control Facility (RATCF) -- An air traffic control facility, located at a U.S. Navy (USN) or Marine Corps (USMC) Air Station, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, the USN and the FAA, the USN, or the USMC. Service may be provided to both civil and military airports.

Radar Approach Control (RAPCON) -- An air traffic control facility, located at a U.S. Air Force (USAF) Base, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, or the USAF. Service may be provided to both civil and military airports.

Radio Contacts -- The initial radio call-up to a flight service station by enroute aircraft; a complete interchange of information and a termination of the contact.

RAPCON -- See RADAR APPROACH CONTROL.

RATCF -- See RADAR AIR TRAFFIC CONTROL FACILITY.

Registered Active General Aviation Aircraft -- A civil aircraft registered with the FAA that has been flown one or more hours during the previous calendar year. Excludes are aircraft owned and operated in regularly scheduled, nonscheduled, or charter service by commercial air carriers and aircraft in excess of 12,500 pounds maximum gross takeoff weight, and owned and operated by a commercial operator certificated by the FAA to engage in intrastate common carriage.

Research and Special Programs Administration (RSPA) -- The Research and Special Programs Administration of the U.S. Department of Transportation. Responsible for the collection of air carrier traffic and financial data on Form 41 that was collected formerly by the Civil Aeronautics Board.

Revenue Passenger Enplanements -- The total number of passengers boarding aircraft. Includes both originating and connecting passengers.

Revenue Passenger Load Factor -- Revenue passenger-miles as a percent of available seat-miles in revenue passenger services, i.e., the proportion of aircraft seating capacity that is actually sold and utilized.

Revenue Passenger Mile (RPM) -- One revenue passenger transported one mile in revenue service. Revenue passenger miles are computed by summation of the products of the revenue aircraft miles flown a flight stage, multiplied by the number of revenue passengers carried on that flight stage.

Revenue Ton Mile (RTM) -- One ton of revenue traffic transported one mile.

RPM -- See REVENUE PASSENGER MILE.

RSPA -- See Research and Special Program Administration

RTM -- See REVENUE TON MILE.

Secondary Airport -- An airport receiving approach control service as a satellite to a primary approach control facility, or one at which control is exercised by the approach control facility under tower en route control procedure.

Supplemental Air Carrier -- An air carrier certificated in accordance with FAR Part 121, and providing nonscheduled or supplemental carriage of passengers or cargo, or both, in air transportation. Also referred to as nonscheduled or charter air carriers.

Terminal Radar Approach Control (TRACON) -- An FAA traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service may be provided to both civil and military airports. A TRACON is similar to a RAPCON (USAF), RATCF (USN), and ARAC (Army).

Total Flight Services -- The sum of flight plans originated and pilot briefs, multiplied by two, plus the

number of aircraft contacted. No credit is allowed for airport advisories.

Total Operations -- All arrivals and departures performed by military, general aviation, commuter/air taxi, and air carrier aircraft.

Tower -- See AIRPORT TRAFFIC CONTROL TOWER.

TRACON -- See TERMINAL RADAR APPROACH CONTROL.

U.S. Flag Carrier -- Air carrier holding a certificate issued by the Department of Transportation, and approved by the President, authorizing the carrier to provide scheduled operations over a specified route between the United States (and/or its territories) and one or more foreign countries.

VFR -- See VISUAL FLIGHT RULES.

VFR Tower -- An airport traffic control tower that does not provide approach control service.

Visual Flight Rules (VFR) -- Rules that govern the procedures for conducting flight under visual conditions. Also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. Used by pilots and controllers to indicate type of flight plan.